MO-HITECH
HEALTH INFORMATION EXCHANGE
DRAFT STRATEGIC PLAN

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1. INTRODUCTION

1.1 Missouri Vision and Objectives

The Health Information Technology for Economic and Clinical Health (HITECH) Act within the 2009 American Recovery and Reinvestment Act (ARRA) provides an unprecedented opportunity for states to access federal funds to plan, design, and implement the infrastructure to support statewide health information exchange (HIE), and to encourage the adoption and use of electronic health records (EHRs). The State of Missouri is well positioned to take full advantage of this opportunity and is committed to ensuring its providers and patients realize the benefits of statewide HIE.

Following the passage of the HITECH Act, Missouri Governor Jay Nixon signed Executive Order 09-27 creating the Missouri Office of Health Information Technology (MO-HITECH) to promote the development and application of an effective health information technology (IT) and health information exchange (HIE) infrastructure for the State of Missouri. The Executive Order was signed recognizing the potential of health IT and HIE to improve the quality and reduce the cost of health care and promote the public health in Missouri. The State of Missouri has worked collaboratively with its stakeholders to develop the current HIE Strategic Plan and is committed to continuing to work with stakeholders to develop and implement an Operational Plan to support statewide HIE. Missouri plans to develop and submit its Operational Plan for to the Office of the National Coordinator for Health IT (ONC) by May 31, 2010.

The MO-HITECH initiative is dedicated to utilizing health IT and HIE to:

- Improve the quality of medical decision-making and the coordination of care;
- Provide accountability in safeguarding the privacy and security of medical information;
- Reduce preventable medical errors and avoid duplication of treatment;
- Improve the public health;
- Enhance the affordability and value of health care; and
- Empower Missourians to take a more active role in their own health care.

Governor Nixon and MO-HITECH are committed to working with Missourians to ensure the state's patients and physicians realize the benefits of HIE.

1.2 Federal Vision and Meaningful Use

On August 20, 2009, ONC released a Funding Opportunity Announcement (FOA), formally signaling the availability of funding under the State Health Information Exchange Cooperative Agreement Program (the Program)[1]. The Program is designed to "facilitate and expand the secure, electronic movement and use of health information among organizations according to nationally recognized standards." The FOA specifies that HIE developed and implemented under the Program must assist health care providers in meeting ARRA's EHR meaningful use requirements. The Medicaid and Medicare financial incentives associated with the HITECH Act demonstrate a significant investment to assist and accelerate providers' adoption and meaningful use of EHRs. Governor Nixon and MO-HITECH are committed to achieving this larger federal vision and to enabling Missouri providers' achievement of meaningful use.

[1] The Program implements the provisions of the American Recovery and Reinvestment Act of 2009 ("ARRA") that provide for grants to states and State-Designated Entities ("SDEs") to promote health information exchange. See ARRA § 3013. State Grants to Promote Health Information Technology. The FOA is available at http://healthit.hhs.gov/portal/server.pt?open=512&objID=1336&parentname=CommunityPage&parentid=47&mode=2&in_hi_userid=11113&cached=true#3.

On December 30, 2009, the Centers for Medicare and Medicaid Services (CMS) and ONC issued two regulations for public comment for the health IT incentive programs enacted under ARRA. The much anticipated regulations provide the federal government's proposed framework for the distribution of more than $44 billion in Medicare and Medicaid incentives to eligible professionals and hospitals for the meaningful use of certified EHRs. Specifically, CMS issued a Notice of Proposed Rule Making (NPRM) on the EHR Incentive Program; the EHR Incentive Program NPRM provides a framework for defining "meaningful use of certified EHR technology" and the rules by which eligible professionals and eligible hospitals will demonstrate meaningful use for the Medicare and Medicaid programs. The proposed approach to meaningful use is an incremental, phased implementation across three stages, reflecting the expectation that the health IT infrastructure will change over time. The proposed rule defines the criteria for "Stage 1" of this evolutionary process; stages 2 and 3 will be defined via future rulemaking. CMS has described each stage as follows:

- Stage 1 is based on "current available technological capabilities and providers' practical experiences." Stage 1 requirements are effective for 2011 and focus on:
    - Electronically capturing health information in a coded format;
    - Using information to track key clinical conditions;
    - Communicating captured information for care coordination purposes; and
    - Reporting of clinical quality measures and public health information.
- Stage 2 criteria for 2013 will likely expand upon Stage 1 criteria in the areas of disease management, clinical decision support, medication management, support for patient access to their health information, transitions in care, quality measurement, research, and bi-directional communication with public health agencies. For Stage 2, CMS may also consider applying the criteria more broadly to both the inpatient and outpatient hospital settings.
- Stage 3 criteria for 2015 will likely focus on achieving improvements in quality, safety and efficiency focusing on specific national high-priority conditions and decision support, patient access to self management tools, access to comprehensive patient data, and improving population health outcomes.

The Missouri HIE Strategic Plan seeks to charter a vision for statewide HIE that ensures Missouri's providers are supported in their pursuit of meaningful use. The Strategic Plan begins to address this vision through strategies that correspond to the five domains identified in the FOA: Governance, Technical Infrastructure, Finance, Legal/Policy, and Business and Technical Operations; Missouri has also established a parallel strategy track focused on Consumer Engagement. The Missouri HIE Operational Plan will address these strategies in greater detail and outline the specifics of their implementation.

1.3 Vision for Patient Care

The MO-HITECH initiative and Strategic Plan are committed to an improved vision for patient care as outlined by Governor Jay Nixon in Executive Order 09-27. Meaningful use, as envisioned by CMS in its NPRM, will dramatically impact patient care by harnessing the potential of health IT and HIE to improve the continuity of care and informed medical decision-making. As patients and their providers become increasingly accustomed to the use of health IT and HIE in their daily lives, patients will be empowered to take a greater and increasingly direct role in the management of their health care and the care of their loved ones. Patients experiencing traumatic illness, chronic disease, and even routine doctor visits will be directly affected by the incorporation of health IT and HIE into their physicians' medical practices. Patients everywhere will be empowered through electronic access to their and their loved ones' medical information to take an increasingly proactive role in their health care and improve their overall quality of

life. This vision of improved patient care through the realization of meaningful use of EHRs among Missouri's physicians is the central focus of the MO-HITECH initiative.

Table 1 below outlines how current patient experiences, ranging from registration to the prescription process, may be impacted as a result of meaningful use.

Activity	2010	2015	Patient Impact
Patient registration	➢ Presents identification ➢ Completes questionnaire ➢ Signs HIPAA form	➢ Presents identification ➢ Confirms demographic information recorded electronically	➢ Minimizes wait time
Patient vitals	➢ Nurses' records and charts changes in paper chart	➢ Nurse records and charts changes in vital signs electronically	➢ Longitudinal view
Medication reconciliation	➢ Patient presents "brown bag" of medications ➢ Doctor records and updates medication list in paper chart	➢ Doctor reviews active medication list with patient from recent visit ➢ Doctor updates active medication list electronically	➢ Medication list is up to date and available electronically
Prescription	➢ Doctor prescribes medications based on diagnosis and known allergies	➢ Doctor generates and transmits prescriptions electronically with knowledge of patient eligibility, formulary, and medication history ➢ Doctor is alerted to drug-drug and drug-allergy interactions	➢ Improved patient safety ➢ Electronic refill requests generated without patient visit
Clinical Labs	➢ Patient is notified of lab results via mail or phone	➢ Lab results are integrated into doctor's EHR	➢ Patient is electronically notified of lab results
Discharge	➢ None	➢ Patient provided with discharge instructions and procedures electronically	➢ Improved patient safety
Patient Access	➢ Patient may request paper copy of medical record	➢ Patients provided electronic to medical record via PHR	➢ Increased patient engagement in care
Patient Follow Up	➢ None	➢ Electronic reminders generated and transmitted to patient for preventive and follow up care	➢ Improved patient adherence and compliance
Referrals	➢ Patient carries paper record	➢ Doctor accesses patient record in EHR	➢ Continuity of care
Population Management	➢ None	➢ Generate lists of patients by condition for outreach, quality improvement, reduction in disparities	➢ Patients are targeted for therapies, disease management

Table 1. Meaningful use and patient impact

1.4 Collaborative Stakeholder Process

The State has overseen and guided an open and collaborative stakeholder process to inform the development of the current HIE Strategic Plan. Prior to the submission of its application to ONC's HIE Cooperative Grant Program the State hosted a series of HIE Regional Listening Sessions around Missouri to facilitate in-person stakeholder education and feedback; the State also hosted a public stakeholder meeting to inform stakeholders of its plan to submit an application and engage stakeholders in the strategic planning process. Following the submission of its application, Governor Nixon signed Executive Order 09-27 officially creating MO-HITECH and the MO-HITECH Advisory Board. In December 2009 the State launched the collaborative strategic planning process, hosting kickoff meetings with the MO-HITECH Advisory Board and six Workgroups: Governance, Technical Infrastructure, Finance, Legal/Policy, Consumer Engagement, and Business and Technical Operations; the Advisory Board continues to meet on a monthly basis and the Workgroups on a biweekly basis (every other week/twice a month), both in-person. In addition, the State has invited public review, comment, and feedback on the issues, questions, and deliverables that MO-HITECH is focused on. The aforementioned components of the collaborative stakeholder process are described in greater detail below.

HIE Regional Listening Sessions

In August 2009, the Missouri Departments of Social Services (DSS) and Health and Senior Services (DHSS), with the support of the Missouri Foundation for Health and Health Care Foundation of Greater Kansas City (HCF), conducted six regional HIE listening sessions to seek stakeholder input regarding the development of HIE and pursuit of federal funds. Listening sessions were held in St. Louis, Kansas City,

Cape Girardeau, Columbia, Kirksville, and Springfield, engaging over 200 participants statewide. Participants represented hospitals, private providers, federally qualified health centers (FQHCs), rural health clinics, long-term care providers, professional associations, health plans, academic institutions, foundations, community-based organizations and coalitions, information technology vendors, regional HIEs, and state government.

The HIE listening sessions were both educational, providing stakeholders with information about the process to secure federal funding for HIE, as well as interactive, soliciting stakeholders' feedback about their vision, goals, and concerns around HIE in Missouri. Several overarching themes emerged across the sessions and participants:

- **Vision**: Participants envisioned a statewide HIE which securely provides access to patient health information to all health providers within Missouri and neighboring states to improve patient outcomes and reduce systemic costs. The envisioned system should account for the needs of both patients and providers, engaging both sectors to support meaningful use of an accessible, secure, and fiscally sustainable statewide HIE.

- **Critical Roles for a Statewide HIE**: Participants agreed on several core roles for a statewide HIE initiative including:

    - Facilitator/Enforcement: The statewide HIE initiative should provide governance, leadership, and accountability around the management of the HIE infrastructure, privacy and security, and a mechanism for consumer and provider participation.

    - Technical Assistance/Sustainability: The statewide HIE initiative should identify common standards and interoperability measures as well as resources to implement and sustain statewide HIE.

    - Educator: The statewide HIE initiative should inform and engage consumers, providers, and policymakers in understanding, trusting, and utilizing a statewide HIE.

- **Concerns**: Participants identified a nuanced set of concerns. They noted that a statewide HIE would not be used if various needs were not met (*e.g.* cost management, public education). Participants also voiced concern about Missouri's resources and capacity to implement a statewide HIE infrastructure featuring privacy and security protections, interoperability standards, and business models to ensure sustainability. In addition, participants highlighted the importance for interstate coordination with Missouri's eight border states, especially Kansas and Illinois that border two of Missouri's major metropolitan areas.

- **Support**: Overall, participants expressed enthusiasm about the potential benefits to patients and providers through thoughtfully developed statewide HIE.

These regional meetings were an important first step in engaging stakeholders in an active dialogue regarding the HIE strategic planning process.

MO-HITECH Advisory Board & Strategic Planning Process

On November 4, 2009, Governor Nixon signed Executive Order 09-27, creating the MO-HITECH Advisory Board, charged with advising the state on the development of Missouri's health IT and HIE strategic and operational plans, and a long term plan for sustainability of Missouri's HIE infrastructure in compliance with the directives of ONC. The Advisory Board is working in parallel and to oversee the efforts of six public Workgroups, each charged with addressing one of the five domains outlined in the funding opportunity announcement (FOA) and an additional Workgroup dedicated specifically to consumer engagement. Beginning in December 2009 and continuing through the submission of the current Strategic Plan, the Workgroups have met biweekly and the Advisory Board has met monthly to inform the

development of the Strategic Plan.

The Advisory Board and Workgroups are co-chaired by members of the public and private sector and staffed by members of the MO-HITECH team and subject matter experts retained as consultants to support the process. The State, through generous financial support from the Missouri Foundation for Health (MFH) and Health Care Foundation of Greater Kansas City (HCF), has engaged Manatt Health Solutions (Manatt) to act as counsel and advisors to the State, providing both strategic advice and implementation/technical assistance. Manatt's engagement with the State supports the development of the current Strategic Plan and the Operational Plan addressing statewide HIE development. The State has also engaged staff from Missouri's quality improvement organization (QIO) Primaris to support the strategic planning process.

A brief description of the Advisory Board and each Workgroup is below:

- **MO-HITECH Advisory Board**: The MO-HITECH Advisory Board is co-chaired by Barrett Toan, formerly CEO and Chairman of the Board of Express Scripts, Inc. and Ronald J. Levy, Director, Missouri Department of Social Services and Health IT Coordinator for the State of Missouri. The 20 member public-private Advisory Board includes representatives from health care providers, health plans, consumer organizations, health care purchasers and employers, state government, local public health agencies, and health professions universities, among others. Please see Appendix 2 (Section 11.2) for a list of Advisory Board members. The Advisory Board is charged with:
    - Providing leadership for and participating in developing a comprehensive and coordinated interoperable health information strategy to drive improvements in health care quality, public health, affordability, and outcomes.
    - Overseeing workgroups in the collaborative development of a shared approach to support Missouri's HIE infrastructure.
    - Developing consensus and making recommendations to MO-HITECH on principles and policies that will ensure:
        - Transparent, representative and accountable governance;
        - Sustainable financing;
        - Protection of privacy, security of health information, and compliance with state and federal law ;
        - Consumer engagement;
        - Business and technical operations supporting widespread health IT adoption and use, coordination with other state and federal programs, and effective evaluation of statewide HIE implementation efforts; and
        - Technical infrastructure to support statewide HIE.
- **Governance Workgroup**: The Governance Workgroup is Co-Chaired by Steve Roling, President and CEO of the Healthcare Foundation of Greater Kansas City and Ronald J. Levy, Director, Missouri Department of Social Services and Health IT Coordinator for the State of Missouri. The Governance Workgroup is charged with:
    - Developing a governance framework that will ensure broad-based stakeholder collaboration and transparency

- Reviewing existing governance models within and outside of Missouri
- Developing and vetting governance models to be recommended to the Advisory Board
- Ensuring the recommended governance framework is characterized by:
  - Alignment with Medicaid and public health programs;
  - The ability to provide oversight and accountability to protect the public interest; and
  - The ability to support providers statewide to achieve meaningful use.

- **Consumer Engagement Workgroup**: The Consumer Engagement Workgroup is co-chaired by Scott Lakin, Lakin Consulting, member of the Board of Directors of the Missouri Health Advocacy Alliance, former state legislator and former Director, Department of Insurance, and Margaret T. Donnelly, Director, Department of Health and Senior Services. The Consumer Engagement Workgroup is charged with:
  - Developing consumer oriented principles and policy priorities for HIE activities in Missouri
  - Ensuring consumer perspectives are integrated throughout the strategic and operational planning process
  - Working with consumer advocacy groups to understand consumers' needs relative to HIE and communicate opportunities for consumer involvement and input

- **Technical Infrastructure Workgroup**: The Technical Infrastructure Workgroup is co-chaired by Mitzi Cardenas, CIO, Truman Medical Center and Doug Young, CIO, Missouri Information Technology Services Division. The Workgroup is charged with:
  - Reviewing examples of technical models being pursued in other states to identify pros and cons of those models relative to Missouri's needs
  - Documenting existing regional and state efforts and investments and resources that may be leveraged to advance statewide HIE
  - Developing recommendations around development of a statewide technical infrastructure to support statewide HIE, including the prioritization and development of HIE services, such as statewide directories, provider authentication and consent management
  - Determining whether or how shared technical services may be utilized for the state's approach to HIE
  - Recommending technical requirements and core services to support Missouri's health IT and HIE efforts, including the identification of protocols and standards to support statewide HIE

- **Business and Technical Operations Workgroup**: The Business and Technical Operations Workgroup is co-chaired by Karl Kochendorfer, MD, University of Missouri, Columbia and Ian McCaslin, MD, Director, Missouri HealthNet Division, Department of Social Services. The Workgroup is charged with:
  - Developing recommendations around the prioritization and development of HIE services,

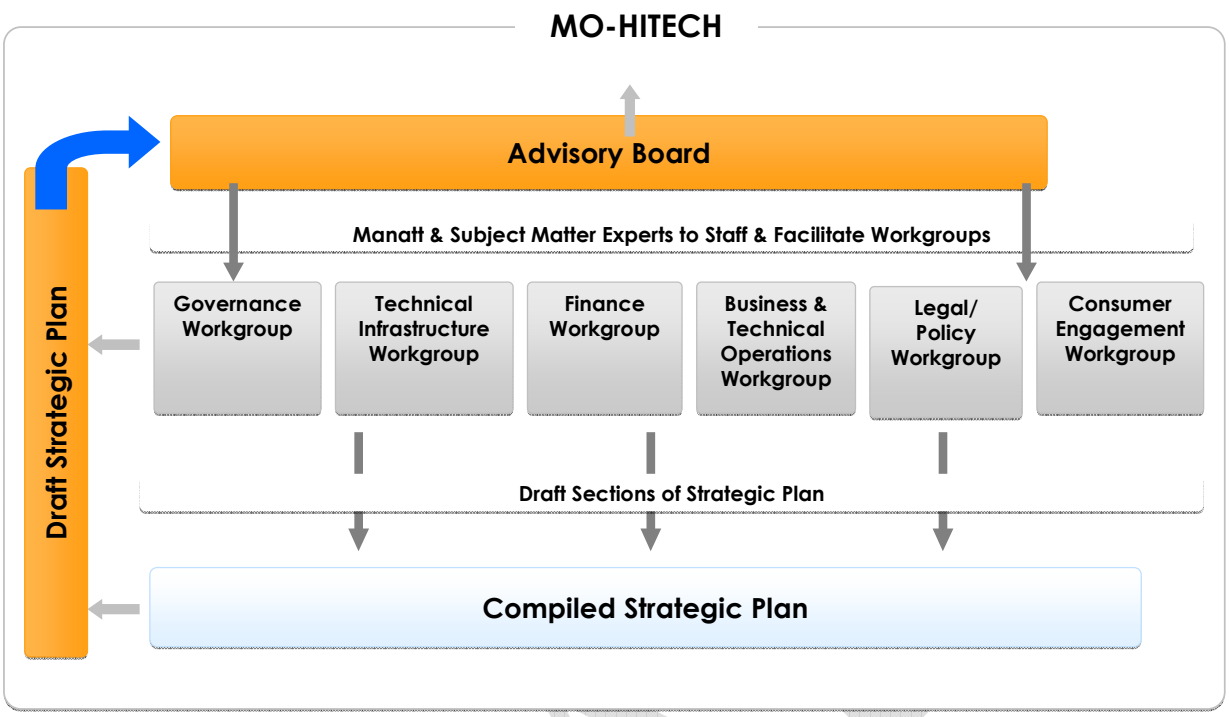
such as electronic eligibility and claims transactions; and electronic prescribing (e-prescribing) and refill requests

- Ensuring coordination with other State and federal programs and initiatives under ARRA, including the Regional Center(s).
- Developing a strategy to support health IT and HIE adoption and meaningful use among Missouri's providers
- Developing and executing the evaluation of the project including data collection and performance measurement

- **Legal/Policy Workgroup**: The Legal/Policy Workgroup is co-chaired by Sandra Johnson, Professor Emerita of Law and Health Care Ethics, St. Louis University School of Law and Doug Nelson, Deputy Commissioner/General Counsel, Office of Administration, State of Missouri. The Legal/Policy Workgroup is charged with:
  - Establishing a framework for trust and accountability that protects the privacy and security of health information and supports consumer control and access to personal health information
  - Identifying practical privacy and security strategies and policies to support secure HIE
  - Identifying operational and environmental processes to support privacy and security policies
  - Ensuring privacy and security strategies, policies and processes are compliant with State and federal law
- **Finance Workgroup**: The Finance Workgroup is co-chaired by Donna Checkett, Senior Vice President, Aetna Medicaid and John M. Huff, Director, Missouri Department of Insurance. The Finance Workgroup is charged with:
  - Determining cost estimates and identifying potential funding sources for supporting the development of statewide HIE
  - Identifying financing strategies and developing an approach for supporting the capital build and sustainability of statewide HIE
  - Developing and updating the project budget
  - Developing a business plan and identifying opportunities for realizing return on investment (ROI)

The charges of the Workgroups are largely interdependent and require communication among Co-Chairs and Workgroup members to ensure that the decisions of one Workgroup appropriately inform the others. The MO-HITECH staff meet regularly with the Co-Chairs to ensure that information is shared appropriately among Workgroups and also communicated to the Advisory Board. The figure below depicts the relationship among the Advisory Board and Workgroups as part of the strategic planning process.

Figure 1. MO-HITECH Strategic Planning Process



In order to ensure the broadest possible opportunities for input, the State has initiated several additional stakeholder feedback mechanisms to complement and inform MO-HITECH, the Advisory Board, and Workgroups. MO-HITECH will continue to evaluate the effectiveness of the current mechanisms described below and offer new ways for the public to participate and provide feedback.

- **Interviews**: As part of its environmental scan, the State conducted interviews with identified key stakeholders representing local HIEs, major health systems, industry associations, consumer groups and other organizations important to the success of HIE. The project team conducted approximately 20 interviews to inform the preparation of the State's HIE Cooperative Agreement application and the environmental scan included in Section 2 of the current Strategic Plan.

- **HIE Outreach Portal/Website and Listserv** (http://dss.mo.gov/hie/index.shtml): The State launched an HIE outreach portal for the purpose of disseminating and collecting information statewide. The portal features regular project updates, Advisory Board and Workgroup meeting materials and summaries, and draft deliverables for public review and comment. The portal contains contact information for the project as well as frequently asked questions (FAQs). Individuals interested in receiving regular updates may request to be added to an HIE listserv that is maintained through the portal's administrator and used to send email blasts as determined necessary by MO-HITECH.

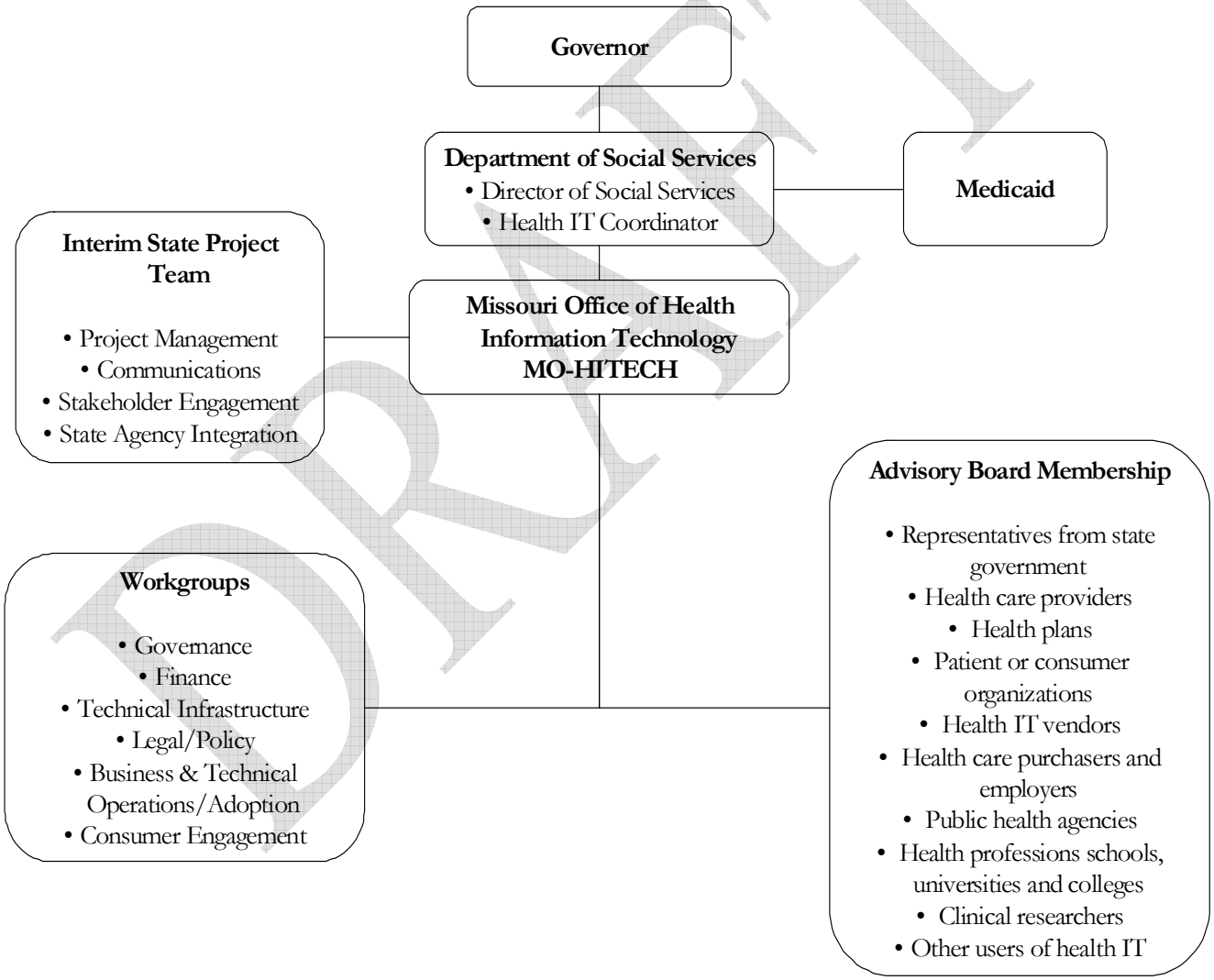
- **Web Tool/Survey**: The State developed and launched a web-based information collection tool to facilitate additional public participation and feedback around HIE. The tool is accessible via the HIE outreach portal and was also sent to stakeholders directly to encourage their participation. To date 46 responses have been logged on the survey and have been summarized to inform Advisory Board and Workgroup deliberations. The survey may be accessed online at http://www.surveymonkey.com/s/36XPF8N.

- **Communications Team**: The State created a Communications Team to support MO-HITECH and the strategic and operational planning efforts to ensure that regular communications are

maintained with both the general public and target stakeholder groups. The Communications Team is responsible for drafting content and creating messages in alignment with the objectives of MO-HITECH and identifying vehicles for their dissemination in local and statewide media. The Communications Team will work closely with the Consumer Engagement Workgroup to ensure that consumer perspectives and concerns are addressed appropriately in communications and that messages are developed and executed in a manner to ensure they reach underserved populations. The Communications Team is staffed by members of MO-HITECH, including representatives from DHSS, DSS, and the Office of Administration, and is coordinating closely with Governor Nixon's office.

Figure 2 below depicts the relationships among the State, MO-HITECH, Advisory Board, Workgroup, and supportive State project team.

Figure 2. Relationships among the State, MO-HITECH, Advisory Board, Workgroups, and State project team.



1.5 Timeline & Next Steps

The MO-HITECH HIE Strategic Plan and collaborative stakeholder process underway will inform the creation of the MO-HITECH HIE Operational Plan; the Operational Plan will outline a corresponding and

comprehensive set of activities to achieve the vision of statewide HIE described in the Strategic Plan and enable Missouri's providers to demonstrate meaningful use. The collaborative stakeholder process described above will continue into the operational planning phase; if necessary the process and workgroup structure may be modified to address required deliverables for the Operational Plan. It is MO-HITECH's vision and intent that stakeholders who have been involved in the strategic planning process will continue to play an important role through the submission of the Operational Plan and into implementation; MO-HITECH anticipates the completion of the Operational Plan by May 30, 2010.

MO-HITECH recognizes that the proposed timeline is aggressive and will require the time and effort of many stakeholder on a voluntary basis. Advisory Board members, Workgroup Co-Chairs, and Workgroup participants are critical to the work effort; their meaningful and consistent participation will ensure Missouri's success in achieving statewide HIE.

A high level timeline outlining the major tasks required for the State HIE Cooperative Agreement Program is below in Figure 3.

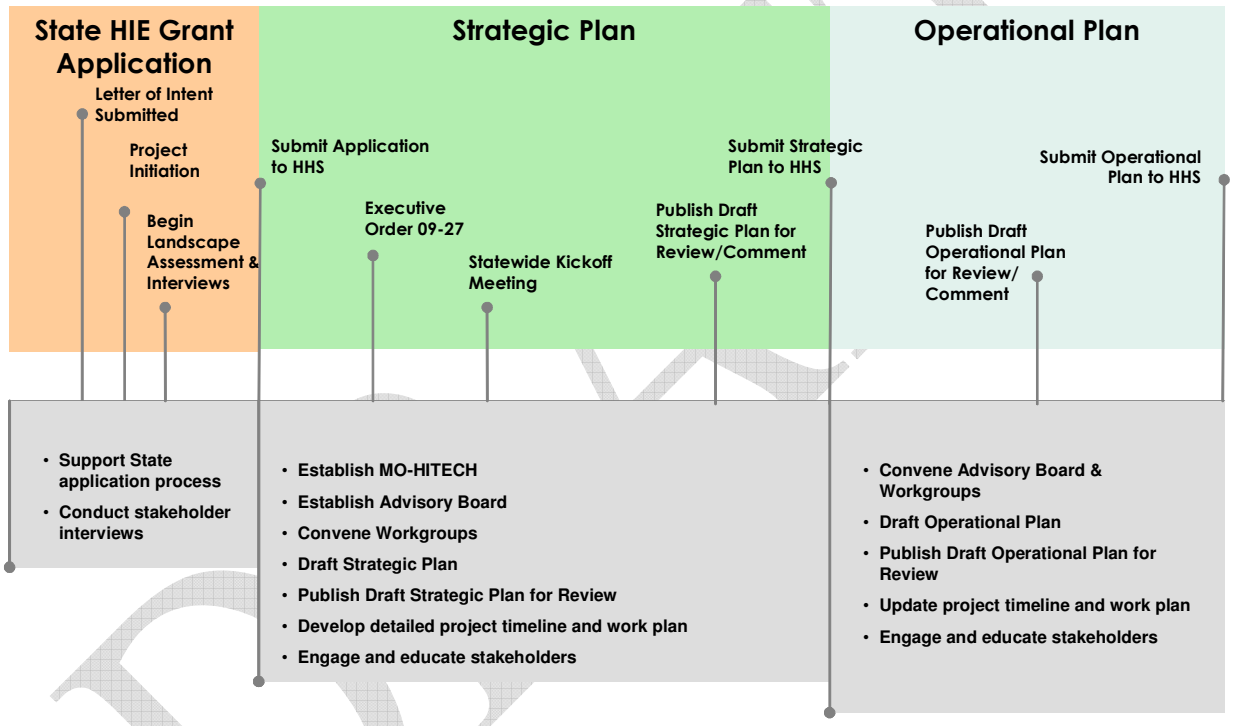


Figure 3. MO-HITECH timeline

2. ENVIRONMENTAL SCAN

2.1 Missouri Health IT and HIE Adoption Landscape

An accurate assessment of a state and its providers' readiness to adopt and implement health IT to achieve meaningful use must take into consideration the state's demographic and geographic diversity. Missouri has the 18th largest population of the 50 States – approximately 6 million residents[2] - and is bordered by eight states: Iowa, Illinois, Kentucky, Tennessee, Arkansas, Oklahoma, Kansas, and Nebraska. No other state is bordered by more than eight states.

Missourians receive health care services from 151 hospitals,[3] approximately 18,000 active physicians, 21 federally qualified health centers (FQHCs), and 342 rural health clinics.[4] Several health systems provide care in multiple counties or regions throughout the state as well in bordering states.

The majority of Missourians have commercial health insurance, primarily through their employers (54%), and another five percent purchase individual coverage. Approximately 28% of Missourians receive health insurance through a public option: 13% receive coverage through Medicaid and 14% receive coverage through Medicare; and 1% receives coverage through another public option. The remaining 13% of the population is uninsured.[5]

There is limited data available around the state of health IT and EHR adoption among Missouri's hospitals and providers. The Missouri Hospital Association and Missouri Academy of Family Physicians have recently conducted surveys to inform the current understanding of the adoption landscape. Further analysis and detail will be pursued as part of the operational planning process.

The Missouri Hospital Association, in coordination with the American Hospital Association's annual survey, conducted a survey of its members to determine the level of health IT adoption among Missouri's hospitals. Based on the definition of "full" and "basic" adoption as described by the Office of the National Coordinator for Health IT (ONC), three Missouri hospitals meet the definition of full adoption and 11 hospitals meet the definition of basic adoption. The criteria around basic and full adoption are available online. Six hospitals are near basic adoption, but lack computerized physician order entry for medication. The hospitals surveyed that are near basic or full adoption range widely within the state from a rural 100-bed hospital to large health systems. At the national level the Office of Health IT Adoption (OHITA) conducted a national survey estimating adoption rates using the same "full" and "basic" criteria. According to the OHITA survey, in 2008 two percent of hospitals met the definition of "full" adoption and eight percent met the definition of "basic" adoption.[6] Based on these national benchmarks, Missouri hospitals exceed the national "full" adoption rate, with seven percent of Missouri hospitals meeting the definition of full adoption.

The Missouri Academy of Family Physicians conducted a survey of its members in January 2009 to identify utilization of electronic medical records. 54% of respondents reported that they utilize electronic medical records in their offices, with an additional 18% responding that they will utilize electronic medical records soon. Ninety-two percent of providers responding to the survey would like to view a log of controlled substance prescriptions that a patient has received. When asked about interest in future

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[2] 2009 Population Estimates, U.S. Census Bureau, Population Estimates Program.
[3] Missouri Hospital Association.
[4] "Missouri: Provider & Services Use, States (2006-2007), U.S.(2007)." Kaiser Family Foundation. http://www.statehealthfacts.org/. Accessed on September 30, 2009.
[5] "Missouri: Health Coverage & Uninsured, States (2006-2007), U.S.(2007)." Kaiser Family Foundation. http://www.statehealthfacts.org/. Accessed on September 30, 2009.
[6] Health IT Adoption Initiative. Measurement of Health IT Adoption. U.S. Department of Health and Human Services. http://healthit.hhs.gov/portal/server.pt?open=512&objID=1152&parentname=CommunityPage&parentid=11&mode=2&in_hi_userid=10741&cached=true. Accessed on January 4, 2010.

Continuing Medical Education (CME) offerings, over 85% of the respondents indicated that electronic health record issues were somewhat or very important.

As part of the Regional Center efforts in Missouri, the lead applicant, the University of Missouri, created and distributed a survey to Missouri providers about their attitudes and experiences with EHRs, with a particular focus on those providers identified as the target of the Regional Center's efforts. The survey instrument, based on New England Journal of Medicine and Medscape surveys, represents a collaborative effort among the Missouri Hospital Association, the Missouri Primary Care Association, the Missouri Association of Osteopathic Physicians and Surgeons, the Missouri State Medical Association, the Missouri Chapter of the American College of Physicians, the Missouri Chapter of the American Academy of Pediatrics, the Missouri Chapter of the American College of Obstetricians and Gynecologists, and the Missouri Academy of Family Physicians. Representatives from the provider organizations provided feedback about the content and design of the survey, and agreed to send out the survey to their members on the University's behalf. Providers submitted survey results in mid-January 2009. *[A summary of survey results will be incorporated when information is available.]*

Like physicians and provider organizations nationwide, Missouri health care providers have struggled to identify the funding and human resource capacity to participate in health information exchange (HIE). Despite these challenges, Missouri providers have continued to pursue HIE in various practice settings. Current adoption and HIE efforts fall largely into two categories: community-driven efforts and large health or hospital systems. These efforts will be discussed in greater detail below.

2.2 Public and Private HIE Initiatives & Assets

The State of Missouri and the private sector have launched several collaborative health IT and HIE initiatives to improve health care delivery. MO-HITECH is committed to working with stakeholders to determine how these and other assets may be leveraged for broader HIE objectives. These initiatives are described briefly below.

Private Statewide Initiatives

Hospital Industry Data Institute

The Hospital Industry Data Institute (HIDI), is a 501(c)(3) not for profit corporation. Founded in 1985 by hospital members, HIDI provides access to secure, quality and timely healthcare data. HIDI collects, analyzes and disseminates discharge data for approximately 800 hospitals nationwide and processes over 40 million discharges annually. HIDI is the data company of the Missouri Hospital Association and the data partner of choice for eight statewide hospital associations. HIDI has 25 years experience managing agreements for the voluntary and secure exchange of data with hospitals in Missouri and bordering metropolitan areas and with other state and federal organizations.

Through voluntary agreements with the Missouri Department of Health and Senior Services, HIDI provides quarterly hospital inpatient and outpatient discharge data used in DHSS databases and reporting. HIDI processes and provides to DHSS discharge data for selected ambulatory surgery centers in Missouri as well. HIDI discharge data collection services utilize a secure, Web-based solution for collecting and editing discharge data ensuring accurate, high-quality data is available to meet hospital and state reporting needs. Annually, HIDI collects hospital characteristic, utilization and financial information and shares this hospital profile database with the DHSS.

HIDI provides inpatient and outpatient discharge data to the Agency for Health Quality and Research (AHRQ) as a participating Healthcare Cost and Utilization Project (HCUP) partner. HCUP is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership sponsored by AHRQ. HCUP is a national information resource of patient-level health care data databases and includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice

patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels.

HIDI data is provided and made available in the following HCUP databases the Nationwide Inpatient Sample (NIS) with inpatient data from a national sample of more than 1,000 hospitals; the Kids' Inpatient Database (KID), a nationwide sample of pediatric inpatient discharges; the Nationwide Emergency Department Sample (NEDS), a database that yields national estimates of emergency department (ED) visits; the State Inpatient Databases (SID) containing the universe of inpatient discharge abstracts from participating states and the State Ambulatory Surgery Databases (SASD) containing data from ambulatory care encounters from hospital-affiliated and sometimes freestanding ambulatory surgery sites and the State Emergency Department Databases (SEDD) containing data from hospital-affiliated emergency departments for visits that do not result in hospitalizations.

Missouri Telehealth Network (http://telehealth.muhealth.org/): The Missouri Telehealth Network (MTN) exists to enhance access to care to underserved areas of Missouri, to provide educational opportunities for health care providers, to further homeland security efforts related to disaster preparedness, to be available in the event of a disaster and to provide research opportunities to clinicians wanting to study via telehealth.

MTN has a 2 gigabit (2G) backbone infrastructure on the MOREnet network. This robust, reliable and secure network connects to the Internet via a high-speed intrastate network consisting of six major circuits connecting several major population centers in the state. The six major circuits form the network backbone, which functions like an interstate highway. All MTN sites use the backbone to connect to each other.

MTN in operation since 1994, has the experience and expertise to train start up telemedicine programs in all crucial areas: clinical, technical, operational, legal and regulatory, manage existing and new sites, and increase access to heath care via telehealth services for rural Missourians. Currently Missouri Telehealth Network oversees the entire network which consists of hospitals, Federally Qualified Health Centers, Community Mental Health Centers, a State Habilitation Center and a host of other types of health care facilities with a total of 200 endpoints in 58 counties.

MTN has over ten years of experience in the field of telehealth and network management. With this comes experience in many areas including:

- managing a telehealth network;
- providing technical assistance to other telehealth networks;
- business and strategic planning;
- evaluation of satisfaction, cost analysis, concordance in diagnosis and treatment of various telehealth modalities;
- telehealth policy activities;
- educational outreach; and
- information dissemination.

Each of these areas of expertise is important in supporting a robust and high performing telehealth network and in supporting the region's network participants.

Private Regional HIE Initiatives

Missouri's HIE activity is characterized by several local and privately-funded initiatives that have remained largely independent. There are several HIE initiatives in varying stages of development throughout Missouri with informal jurisdictions based largely on geographic boundaries. These efforts are predominantly overseen by Boards of Directors or Advisory Groups comprised of local stakeholders and health care leaders, and representatives of organizations who are or plan to participate in the HIE. Most are organized around the mission to improve health care in their communities through HIE and health IT and are linked closely with large provider organizations in the community. While these efforts share a common mission, they vary in their technical approach, stage of technical development, and ability to share clinical data. Figure 4 below depicts the geographic locations of the various initiatives described below:

Figure 4. Regional HIE Initiatives

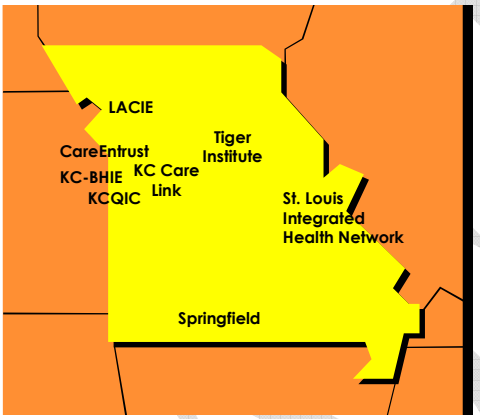


Table 2 below provides a side-by-side overview of various HIE initiatives in Missouri. These are described in greater detail below.

HIE	Year	Region	Org	Technology Approach	Operational* (Data Exchanged)	NHIN	Clinical Priorities	Financing to Date	Sustainability Model
CareEntrust	2007	Kansas City	501c3	Centralized	▪ Centralized ▪ Claims (read-only) ▪ Self entered ▪ Clinical data (read-only on interfaces plus some direct entry)	NA	▪ Consumer access & control ▪ Provider access to clinical data at the point of care	Employer supported (annual contributions)	Employer supported
Kansas City Bi-State HIE	2009	Kansas City (13 counties in MO; 12 in KS)	Incubated by Mid-America Regional Council	Hybrid	NA; RFP released	NA	• Enhance access, quality, safety & the efficiency of health care	Foundation supported	In development
KC CareLink	2001	Kansas City (bi-state)	Not-for-profit	Centralized	NA	NA	• Care delivery and coordination to the under- and uninsured	Foundation and payer supported	Unknown
LACIE	2009	St. Joseph	Subsidiary of Heartland Health; 501c3 pending	Hybrid model: Aggregated & federated	NA	NA	• Clinically driven exchange • Quality & safety for patients	Heartland Health Hospital has provided funding to date	In development
Springfield – Greene County Regional Health Comm.	2009	Springfield & Greene Counties	501c3	TBD	NA	NA	• Improve patient care through HIE • Medical home	Missouri Foundation for Health	In development
St. Louis Integrated Health Network	2003	St. Louis	501c3	Hybrid model: Aggregated & federated	Data feeds are currently in testing	NA	▪ Emergency department discharge summaries & ADT data	Hospitals and community health centers have provided funding to date	County has allocated funding; business case is in development
Tiger Institute	2009	Mid-Missouri	Subsidiary of the University of Missouri	TBD	NA	NA	In development	University of Missouri supported	In development

Table 2. Regional HIE Initiatives

A brief overview of the main HIE initiatives in Missouri appears below. Please note the descriptions below reflect publicly available information about each initiative; as well as information gathered during stakeholder interviews.

- **CareEntrust** (http://www.careentrust.org/index.php): CareEntrust is an independent, not-for-profit organization representing two dozen Kansas City-based employers and over 100,000 employees and their dependents. CareEntrust's mission is to make available a longitudinal view of patient information for consumers and health care entities to improve health care quality, efficiency and safety. A broad cross-section of employer sponsors provide CareEntrust as a benefit to their employees and dependents. The centerpiece of the CareEntrust system is the CareEntrust Health Record, a secure application that aggregates relevant health care information – including clinical, claims, and customer-entered data – and delivers it to health care providers when and where they need it. CareEntrust offers consumers control over their own health history and the status of their current care, with the option of sharing their CareEntrust Health Record with their health care providers.

- **Kansas City Bi-State HIE:** The Mid-America Regional Council (MARC), the Metropolitan Planning Organization and association of city and county governments for the bi-state Kansas City metropolitan area, is assisting a broad coalition of health care stakeholders in Kansas City and the surrounding community in the development of a regional HIE. The Kansas City Bi-State Health Information Exchange (KCBHIE) is a developing organization and MARC serves as its fiscal agent. The mission of KCBHIE is to enhance access, quality, safety and the efficiency of health care in metropolitan Kansas City and surrounding areas through the implementation of a secure, integrated, interoperable HIE that supports the data needs of authorized users across organizational boundaries including: health care providers, health systems/hospitals, patients, employers and other stakeholders in the regional health care delivery system. MARC is finalizing a RFP process to select a strategic partner to furnish the core technology and infrastructure, and support the design, implementation, enhancements and ongoing support for the KCBHIE system.

- **Kansas City Quality Improvement Consortium** (http://kcqic.org/): The Kansas City Quality Improvement Consortium (KCQIC) was formed by the UAW-Ford Community Health Care Initiative and community stakeholders in November 2000 in response to the growing emphasis on evidence-based medicine. KCQIC is a not-for-profit whose membership includes stakeholders who share the goal of quality health care. KCQIC is one of 24 Chartered Value Exchanges supported by the Agency for Healthcare Research and Quality (AHRQ). KCQIC is also part of the Robert Wood Johnson Foundation's Aligning Forces for Quality initiative, involving 14 communities around the country. Both of these initiatives focus on health care quality.

- **KC CareLink** (http://www.kccarelink.org/index.php): KC CareLink is a not-for-profit electronic HIE linking health care providers in its bi-state community. KC CareLink is used by health care providers to ensure that they can better coordinate and deliver care to their patients, particularly the under-insured and uninsured. KC CareLink has collaborated to enable secure delivery of timely and accurate electronic health information to authorized users across organizational boundaries with the goal to help improve the efficiency, accessibility and continuity of health care. KC CareLink provides a 24/7 resource to over 500 users at 19 separate sites, maintains a database with over 185,000 unduplicated patients, and supports software applications to create, manage and report on thousands of referrals between safety net providers each year.

- **Lewis and Clark Information Exchange** (http://www.lewisandclarkinformationexchange.org): The Lewis and Clark Information Exchange (LACIE) was created as a tool to collect information from member organizations, combine the data centric to the person, and ultimately allow for lifetime health records within

Northwest Missouri, Northeast Kansas, Southeast Nebraska, and Southwest Iowa. LACIE aims to reach out to non-traditional stakeholders and recruit employers, government, schools, and the community in an effort to engage and empower all children and adults to continuously improve their health and quality of life. LACIE uses an interoperability solution facilitating connectivity between multiple venues to electronically deliver relevant personal health information in a secure manner. Through LACIE, providers share information such as basic patient demographic and visit information, medications, allergies, immunizations, and clinical reports. This information is routed into the patient's community electronic medical record within LACIE and combined with other existing information so that the care provider has a complete picture of the patient's health history. LACIE uses Cerner-centric Healthe Hub and plans to add a federated option in the Spring of 2010. Heartland Health submitted a Beacon Community proposal for telehealth in 26 counties in the four-state-corner area leveraging LACIE.

- **Midwest Health Initiative:** The Midwest Health Initiative (MHI) is a multi-stakeholder organization that brings to together physicians, hospitals, business, labor and consumer representatives. MHI uses shared knowledge and understanding to inspire improvements in health and in the quality, affordability, safety, timeliness, patient centeredness, and equity of health care. MHI has built a database of de-identified health care claims, including pharmacy, and eligibility information on more than 1.2 million lives from the St. Louis Metropolitan Statistical Area and the 16 counties west. During the first quarter 2010, MHI will provide the region's physicians and hospitals their first bi-annual private report of their performance on selected quality measures. MHI's vision is to serve as a community resource and will make its data set available to researchers, information exchanges and others interested in elevating the region's health and health care.

- **St. Louis Integrated Health Network** (http://www.stlouisihn.org/): In its 2003 strategic plan for improving safety net health care, the St. Louis Regional Health Commission (RHC) recommended the development of a permanent regional network of safety net providers to coordinate and integrate primary and specialty care safety net services in St. Louis City and County. In response to this recommendation and HRSA's Integrated Services Development Initiative, the St. Louis Integrated Health Network (IHN), a Missouri not-for-profit corporation, formed in November 2003. The IHN, in partnership with the RHC, is building an HIE project as part of its Primary Care Home Initiative, which focuses on improving access to a medical home for all underserved patients and reducing non-emergency use of area emergency departments. The HIE project focuses on the development of a Network Master Patient Index (NMPI) across 18 participating provider organizations, including all four area Federally Qualified Health Centers, both area medical schools, St. Louis City and County Departments of Health, and all 9 local hospital emergency departments in areas of high need. The vision for the IHN NMPI is a technology solution across St. Louis safety net providers designed to support the needs of St. Louis's underserved population and meet a specific set of requirements.

- **Tiger Institute for Health Innovation**: In September 2009, the University of Missouri (MU) and Cerner Corporation announced their partnership with plans to create the Tiger Institute for Health Innovation. The Tiger Institute's mission is to create innovations in healthcare delivery that could potentially reduce Missourians' escalating healthcare costs through modernizing and automating the way healthcare is delivered. The Tiger Institute is a public—private collaboration that will work on research and development projects in addition to managing much of the health system's IT efforts. The next phase will connect all of the University of Missouri Health Care (UMHC) hospitals, clinics and pharmacies, and could eventually extend to providers in the Columbia community and across the state of Missouri.

Public Initiatives and Assets

- **Multi-Department Assessment of Readiness**: The Department of Social Services MO HealthNet Division (Medicaid), Department of Health and Senior Services (DHSS), and the Department of Mental Health (DMH) have a collaborative agreement to implement HIE for their shared client base. As part of this initiative high level information will be collected as part of a multi-department assessment of readiness to be completed within the planning phase of the project so that the assessment may inform the State's efforts and identify State assets that may be leveraged:

- **Missouri Health Strategic Architectures and Information Cooperative (MOHSAIC) System:** In the early 90's the Missouri Department of Health and Senior Services (DHSS) developed a strategic plan for information systems that included a client centered integrated data delivery system. This would mean that a client could receive services from more than one state or federally funded program, but instead of having to give their name and other demographic information each time they received a new service, the integrated data system would have that information after the first time a client registered with DHSS. In 1994 the first phase of the Missouri Health Strategic Architectures and Information Cooperative (MOHSAIC) integrated application was implemented and contained the common demographics, appointment scheduling, inventory and immunization/TB components of the system. In order for local public health agencies (LPHAs) to gain access to the system, DHSS created a statewide network that consolidated access to MOHSAIC, Vital Records and Women, Infants and Children (WIC) applications. MOHSAIC continues to provide a statewide network, software and integrated database system that allows access to client information to sites that provide health services to the people in Missouri, (e.g., LPHAs, private providers hospitals, etc.). With the recent implementation of web based applications, the internet is now used as the primary network for connectivity. MOHSAIC collects and stores information on clients, providers and services provided. It creates an electronic public health record for those receiving services in Missouri from health care providers. These include screening results for: metabolic, newborn hearing, cancer, and environmental conditions. Data are also included on services provided for head injury, communicable diseases, and service coordination. In addition to other types of data, MOHSAIC currently includes approximately 24 million doses of vaccine, 700,000 communicable disease reports, and 1.4 million lead test results. MOHSAIC is interoperable with other data systems at DHSS and the Missouri Department of Social Services, allowing MOHSAIC to look up Medicaid information and to share data on the individuals served. DHSS has added many different DHSS program components to MOHSAIC thus realizing the initial concept for an integrated data delivery system. DHSS was also cognizant that some programs had data systems that were mandated for use by the federal government and could not be a part of MOHSAIC. DHSS still wanted to be able to connect clients even if they were in the non-MOHSAIC applications. It was decided that this could be done by storing DCNs for every DHSS client even if they were not registered in MOHSAIC. This is done by connecting to the DSS Common Area where DCN numbers are stored. (See Figure 5)

  MOHSAIC implemented electronic data exchanges with the DSS Medicaid billing system in 1994 to retrieve doses of vaccine included in their claims data. In addition, a near daily exchange was later implemented between Gateway, EDI, a medical billing clearinghouse, to provide immunizations included in billing data from participating providers. This exchange resulted in doses of vaccine administered to private insurance/pay clients being included in MOHSAIC.

- **MOHSAIC Common Area:** The common area in the MOHSAIC database is the true "hub" of the system. The common area includes information on a client like DCN number from DSS, demographics, household information, and addresses. The common area includes providers so that each application does not need to type in provider information, once it is entered; it is available for all MOHSAIC applications to use. The common area of MOHSAIC also includes

application objects that are used by more than one application including geocoding, security, and claims processing. The information used by these shared services is also contained in the common area of the database. (See Figure below)

- **Data Exchanges/Loads and Public Health Information Network (PHIN):** When the concept of MOHSAIC was first developed, it was created primarily as a data entry system with little thought to data loads or data exchanges because most entities did not have robust enough data systems to support such activities. MOHSAIC is no longer primarily a data entry system, but more of a data delivery system. DHSS currently receives data electronically from over 80 hospitals in Missouri and 4 laboratories. Most of this data exchange is in real-time HL-7 reporting. DHSS receives an electronic transmission of immunizations included in billing data processed by Medicaid and Gateway EDI for their participating providers. Data is also exchanged with the Centers for Disease Control and Prevention (CDC) on a daily basis. DHSS participates in the CDC Public Health Information Network. The CDC Public Health Information Network (PHIN) is a national initiative to improve the capacity of public health to use and exchange information electronically by promoting the use of standards and defining functional and technical requirements. PHIN strives to improve public health by enhancing research and practice through best practices related to efficient, effective, and interoperable public health information systems. All CDC funded components In MOHSAIC are PHIN compliant and able to exchange information through the Public Health Information Network. (See Figure 5)

- **DHSS Public Health Profile:** In order to provide a more rapid summary of the public health information included in MOHSAIC to health care providers with a need to know, DHSS developed a web based summary application. The Public Health Profile allows providers to type the DHSS Public Health Profile URL into their web browser, enter their user ID and password and look up a client. The DHSS Public Health Profile summarizes information about the client's immunization status and what immunizations are due, newborn blood spot, newborn hearing and lead testing results as reported to DHSS. The application provides an indicator when additional follow-up for these conditions are due and shows any allergies that have been documented. This allows providers a "one-stop-shop" for information reported to DHSS about a client instead of having to lookup the information in several different MOHSAIC components with different user ID's and passwords. (See Figure 5)

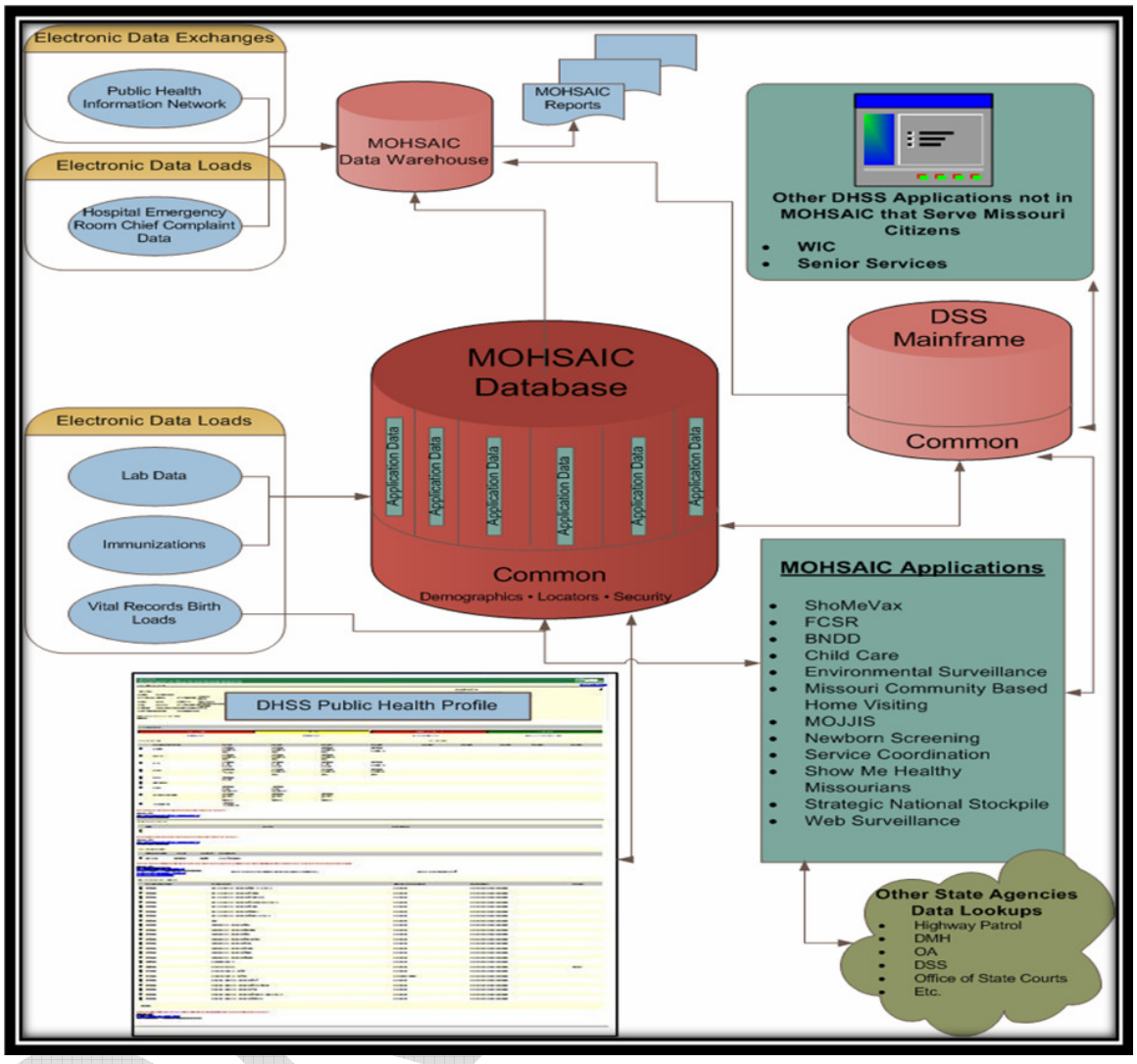


Figure 5. DHSS MOHSAIC, Common Area, Data Exchanges/Loads, Public Health Information Network and DHSS Public Health Profile Graphical Layout

- **Common Identification Number:** In the early 1980's the Department of Social Services (DSS) started assigning a Departmental Client Number (DCN) to the individuals that they served within certain programs. Other programs at DSS soon started to use this same number to identify clients being served including the Medicaid participants. An electronic "common area" was setup on the mainframe to hold the basic information regarding a client and the DCN number became the unique identifier for these clients. The WIC program at DHSS started using the DCN to identify their clients and household members.

  In the early 1990's the DHSS began to develop the MOHSAIC system and a decision was made to use the "common area" at DSS to look up clients for the MOHSAIC system. It was also decided that if a client being entered into the MOHSAIC system did not already have a DCN number assigned then a DCN would be immediately assigned by DHSS and the information would be put in the "common area" for use by both agencies. In 1994 DHSS began assigning DCN numbers to every child born in the state of Missouri and the information is stored in the "common area." With the proper security measures in place, this allows interoperability between data systems within each organization and allows both agencies to share information about Missouri clients.

Currently an effort is being made by the Department of Mental Health (DMH) to look up DCN numbers on the clients held in CIMOR, their major data system, and to assign numbers if the clients do not already have them assigned. With the addition of the clients served by DMH into the "common area" it is estimated that approximately 50% of Missouri's population will have been assigned a DCN number and have information stored in the "common area."

- **MO HealthNet HIE/EHR**: The leadership within MO HealthNet, Missouri's Medicaid program, understands the importance and benefits of EHRs and HIE. Health IT is key to transforming Missouri's health care system through the provision of health IT tools and capabilities designed and proven in the Medicaid environment. Many of these tools and capabilities are "plug-n-play" components built using a Service Oriented Architecture (SOA) that follows Medicaid Information Technology Architecture (MITA) guidelines. CCHIT certification guidelines for interoperability are closely followed so the system can be eligible for "meaningful use" incentives.

  The MO HealthNet solution is a "hybrid" architecture based on a secure, hosted-platform, which includes full Active Server Pages (ASP) version, and EMR-lite capabilities. At the heart of the solution is the clinical surveillance engine, which performs real-time analysis on the combined Federated and Centralized data gathered from disparate sources. Providers will be able to view this data through the EMR-lite front end solution, DirectAccess™. For providers with an existing EMR, this data is shared via a HITSP c32 CCD which can be displayed in their EMR system.

  Clinical data will be exchanged with other HIE partners, including narratives, laboratory results, radiology reports with associated clinical images, immunization data and other image documents. Direct provider input entered through DirectAccess encounter notes, patient vital signs and lab results can also be exchanged. The DirectAccess solution facilitates the exchange of patient-centric health information between providers, clinics, and hospitals.

  With real time data analysis and data consolidation from multiple systems, DirectAccess will give providers at the point of care patient-specific history, risks, gaps-in-care, reporting, and treatment alerts. Additional capabilities include e-prescribing and secure provider messaging exchange. The goal is to provide a clear understanding of the patient's previous care and indicators to encourage potential quality of care improvements to all the connected partners.

  The HIE for MO HealthNet is being implemented in phases. Connectivity with other HIE partners is scheduled for first quarter 2010. The complete HIE/EHR solution will be implemented by August 2010.

2.3 Implementation of HIE Services

Missouri is home to multiple targeted efforts to exchange health information for the purposes of improving patient care and promoting the public health. To date, these initiatives, which are at various stages of development and maturity, have been largely segmented by geography or within health systems or public agencies. A primary goal of Missouri's HIE efforts will be to leverage and integrate existing initiatives into a statewide infrastructure for exchange. A description of public and private sector capabilities relative to specific electronic transactions and reports is below. The information below was obtained from MO HealthNet (Medicaid), Department of Health and Senior Services (DHSS), Department of Mental Health (DMH) and publicly available information. This information will be supplemented with further analysis in the course of the operational planning and implementation efforts to describe these capabilities in greater detail.

Current State	Capabilities
Electronic eligibility and claims transactions	• **MO HealthNet (Medicaid)**: Over 13,000 users representing providers treating over 82% of Medicaid participants have been trained on the CyberAccess© web portal. Since October 1, 2009 prescription and medical encounter claims data for all 850,000 MO HealthNet participants has been available via CyberAccess©. Eligibility is currently available via a separate portal and will be integrated into CyberAccess© during the second quarter of 2010. Pharmacy claims are adjudicated real time; all other claims may be filed electronically and will be real time in late 2010. • **Department of Health and Senior Services (DHSS):** DHSS currently has two programs that provide support for children with disabilities and cancer screenings that are required to pay claims. The paid claims data is available via the Missouri Health Strategic Architectures and Information Cooperative (MOHSAIC) system and eligibility is available electronically including the connectivity to look up Medicaid eligibility. • **Department of Mental Health (DMH):** DMH receives electronic eligibility data from DSS, and has incorporated that data into its DMH enterprise web-based system, Customer Information Management, Outcomes & Reporting (CIMOR). The CIMOR system also creates and sends claims to payers including Medicaid, Medicare and private insurance companies using HIPAA standard 837 transactions. • **Midwest Health Initiative (MHI)**: MHI has built a database of de-identified health care claims, including pharmacy, and eligibility information on more than 1.2 million lives from the St. Louis Metropolitan Statistical Area and the 16 counties west.
Electronic clinical laboratory ordering and results delivery	• **MO HealthNet**: Lab results for one major lab vendor are currently available electronically in CyberAccess© in PDF, digital availability. Results from other lab vendors are scheduled for implementation January 2010. • **DHSS:** DHSS receives lab results, however, they are for public health reporting reasons and are outlined in the public health reporting section below.
Electronic public health reporting (immunizations, notifiable laboratory results)	• **MO HealthNet**: Interface with DHSS immunization system is scheduled for J the second quarter of 2010. Vaccines paid for by MO HealthNet Division (MHD) are currently viewable. Notifiable laboratory results are scheduled to be available in the second quarter of 2010. • **DHSS:** DHSS receives and reports on the data outlined below. ▪ Electronic lab results: DHSS receives approximately 160,000 electronic lab results annually from 4 major laboratories for public health reporting of newborn genetic screenings, lead screenings, HIV/AIDS, STD's and various other communicable diseases. ▪ Immunizations: DHSS currently receives 48% of immunization reports for the immunization registry via electronic communications ▪ Surveillance reports: 80 Missouri hospitals report approximately 10,000 emergency room chief complaint reports and in-patient chief complaint reports daily to DHSS ▪ Infections: Hospital acquired infection data is electronically received by DHSS • **DMH:** DMH receives lab results from contracted laboratory services and incorporates those results into claims and consumer services data.
Quality reporting capabilities	• **MO HealthNet**: Peer profiling was completed during the first quarter of 2010. Risk level, gaps in care and divergence from best practices included. Limited care coordination information is currently available in Care Connection which is interoperable with CyberAccess©. • **DHSS**: MOHSAIC includes a reminder feature that indicates when a service is due. This indicator is present when any member of the family's records is accessed and indicates which member of the family is due for a service. In addition, the

Immunization component of MOHSAIC has reporting capability to generate a report of all children needing a vaccine by service provider. This allows the sending of reminder/recall notices to the caregiver. DHSS is responsible for a Cancer Registry that shares data with the Center for Disease Control and Prevention (CDC) . Laboratories are required to submit the positive results of tumors for patients to the Registry. Cancer screenings funded by DHSS are reported to DHSS and CDC to complete reviews of patient follow-up and identify gaps in care.

- **DMH**: DMH has developed a comprehensive data warehouse from both legacy systems historic data andCIMOR data updates processed daily. This data is available for numerous automated and ad-hoc reports that are used by DMH and IT staff for quality assurance, management decision-making, and regulatory reporting requirements.
- **Hospital Industry Data Institute:** Using its discharge databases, the Hospital Industry Data Institute (HIDI) provides quarterly reports used in the MHA Hospital Performance Project, a cooperative health data effort between the Missouri Hospital Association and Missouri hospitals to provide individual, aggregate and comparative hospital data on selected, nationally defined indicators of inpatient health care quality and patient safety to assist participating hospitals in the evaluation of quality of care. HIDI uses the AHRQ quality indicator definitions (QI) to create comparative benchmark reports for Prevention QIs, Inpatient QIs and Patient Safety QIs. Prevention QIs identify hospital admissions that evidence suggests could have been avoided through high-quality outpatient care. Inpatient QIs reflect quality of care inside hospitals including inpatient mortality for medical conditions and surgical procedures. Patient Safety Indicators focus on potentially avoidable complications and iatrogenic events. HIDI provides FOCUS Reports on a periodic basis to hospitals. This series of reports uses HIDI data sets to inform hospitals on focused high-priority issues such as readmissions, transfers, etc.Through its HCUP partnership, HIDI makes Missouri discharge data available to AHRQ for various quality research and initiatives. HIDI currently participates in the CDC pediatric rotavirus efficacy research project.
- **Midwest Health Initiative (MHI)**: MHI has built a database of de-identified health care claims, including pharmacy, and eligibility information on more than 1.2 million lives from the St. Louis Metropolitan Statistical Area and the 16 counties west. During the first half of this year, MHI will provide the region's physicians and hospitals private reports of their performance on selected quality measures. MHI's vision is to serve as a community resource. Over time, it will provide the community with information on variation in care, resource utilization, and cost, with relevant benchmarks and opportunities for improvement. MHI will also make its data set available to researchers, information exchanges and others interested in elevating our region's health and health care.
- **Primaris:** Primaris, Missouri's Medicare Quality Improvement Organization (QIO), has a robust history of encouraging adoption of health IT and use of EHRs for reporting of quality measures.
  - Throughout the DOQ-IT program in the 8th Scope of Work under Medicare, Primaris assisted physician practices with evaluation of needs, vendor selection, contracting and process change management in adopting electronic health records (EHRs). Primaris then worked with these practices to facilitate submission of data from their EHRs for selected quality measures to the DOQ-IT Warehouse, a national repository where private healthcare data is stored for reporting purposes.
  - During the current 9th Scope of Work under Medicare, Primaris is building on these efforts on several fronts. Working with hospitals under the Patient Safety Theme, reporting is continuing on quality measures from the 8th SOW and moving into new areas of improvement such as surgical care, heart failure care and drug safety. Primaris is also working with these institutions to improve measures around rates of health care-associated methicillin-resistant

	Staphylococcus aureus (MRSA) infections and to reduce pressure ulcer rates. ▪ Primaris is also working with physician offices in the 9th SOW to make effective use of their EHRs for quality improvement and reporting of quality measures. Under the Prevention Theme, practices with EHRs are using their data to initiate interventions encouraging improved compliance with preventive diagnostic testing around mammograms, influenza and pneumococcal vaccinations, and colorectal cancer screening. Missouri's Primaris was selected as one of eleven QIOs for a pilot project to implement system changes for people with chronic kidney disease (CKD) – utilizing quality measures and EHR involvement – to both improve patient care and reduce costly complications from the disease. • **Kansas City Quality Improvement Consortium**: The Kansas City Quality Improvement Consortium (KCQIC) collected responses from over 40,000 adult patients about their experiences with over 700 primary care physicians in the Greater Kansas City Area. KCQIC published the results of the survey in July 2009 and began reporting out on physician office and group level data in January 2010. KCQIC has provided individual physician metrics to physicians since 2002, and will pursue metrics around cost and efficiency in the future; 1,270 primary care physicians received individual reports this year. Also, on December 31, 2009, KCQIC posted consumer-friendly hospital data reformatted from CMS Hospital Compare. • **University of Missouri and the Tiger Institute**: As of March 2009, the University of Missouri (and now the Tiger Institute) utilized a fully automated system to report measures for the Physician Quality Improvement Reporting Initiative) through its EHR. This effort has demonstrated an increase in the quality of care delivered to the diabetic patients at the University of Missouri Healthcare System.
Prescription fill status and/or medication fill history	• **MO HealthNet**: A record of all prescriptions paid for by MHD is available today for all 850,000 participants as is the record of refills and a medication possession ratio (MPR) is available for chronic medications and is a surrogate of medication adherence. This tool is used by DMH to manage SMI therapies. This is a near real-time record, claims are visible within seconds of claim adjudication. • **DMH:** DMH uses software from QuadraMed Corporation for handling prescription fills, medication inventory, and other pharmacy management activities. The contract for this software will expire 12/2010, so DMH is currently taking steps to prepare an RFP to purchase a replacement system by 1/2011.
Clinical summary exchange for care coordination and patient engagement	• **MO HealthNet**: Continuity of Care Document (CCD) Viewer and the intake of HL7 home monitoring information are both scheduled for the second quarter of 2010. Second phase to include electrocardiogram (ECG) wave/rhythm strips in August 2010; episodes of care in June 2010; and medication reconciliation and discharge summary exchange by September 2010. • **DHSS**: DHSS has developed the Public Health Profile application that summarizes the public health results included in MOHSAIC for each client. Users must have a user ID and password to access the web-based system that allows them to search for a client and view any immunizations, and screening results. These screening results include: newborn metabolic, newborn hearing, and lead. Health care providers may print a copy of this information for inclusion in their records to assist them in identifying gaps in care and needed client follow-up. • **DMH:** The DMH CIMOR system makes a set of consumer information available to all DMH service providers that helps support care coordination. ▪ DMH provides limited data from CIMOR to MOHealthNet for services delivered to common consumers. ▪ DMH also participated along with several other agencies to design a data warehouse to contain data from all agencies that provide services and supports to children. The children's data warehouse design, if funded and implemented, would serve as a valuable tool to all agencies in coordinating care provided to children.

	One subset of the community mental health centers utilizing CyberAccess© is sharing clinical assessment data through CyberAccess© with its Federally Qualified Health Center (FQHC) partners in a project screening seriously mentally ill Medicaid patients for metabolic syndrome and integrating behavioral and physical health services.
Electronic prescribing and refill requests	• **MO HealthNet**: E-prescribing and refill requests are available now through a Surescripts certified portion of CyberAccess©. Formulary information is available currently in CyberAccess©. Class one alerts are currently available in CyberAccess©. • **Surescripts:** In 2008, 3.97% of all prescriptions were transmitted electronically, representing more than a 100% increase in prescriptions transmitted electronically in 2007.[7] The number of Missouri physicians routing prescriptions electronically also more than doubled with 1,389 physicians routing e-prescriptions in 2008, representing a 176% growth since 2007. Please see figures 6 and 7 below depicting levels of e-prescribing adoptions

Figure 6. Percent Total Prescriptions Routed Electronically in Missouri (2006 – 2008)

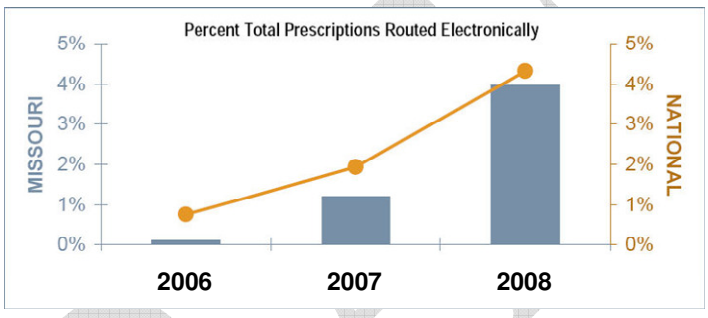
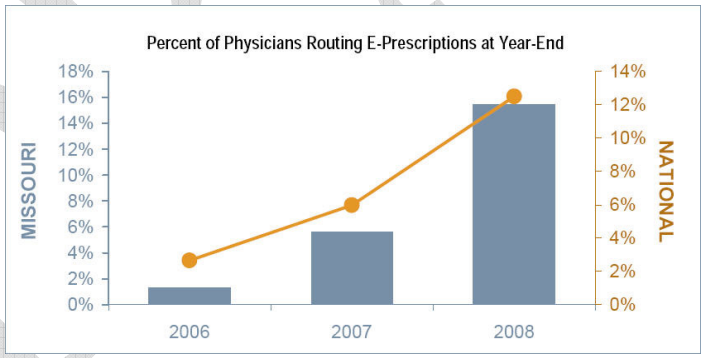


Figure 7. Percent Physicians Routing Prescriptions Electronically in Missouri (2006 – 2008)



Source: Surescripts

[7] Surescripts. State Progress Report on E-Prescribing: Missouri. Data as of December 31, 2008. Available at: http://www.surescripts.net/e-prescribing-statistics-charts.aspx?name=MO2009. Accessed on October 1, 2009.

2.4 Existing Collaborations that may be Leveraged

Missouri stakeholders are active in local, regional, statewide, and national health IT and HIE activities and collaborations. Stakeholders are active in national efforts and organizations including the Certification Commission for Health Information Technology (CCHIT), eHealth Initiative (eHI), Nationwide Health Information Network (NHIN), Health Information Management Systems Society (HIMSS), the Health Information Security and Privacy Collaboration, Public Health Information Network (PHIN), and multi-state Statewide HIe Coalition. In addition, many stakeholders participating in MO-HITECH efforts are involved in the HIE planning efforts of Missouri's neighboring states, serving as an important bridge and line of communication among the state-based initiatives. Stakeholders contribute their time and resources to these efforts, as well as the ongoing MO-HITECH strategic and operational planning process, on a voluntary basis, representing a strong commitment by these individuals and their organizations to the success of HIE in Missouri. A description of Missouri's involvement in two of these initiatives is described in greater detail below.

Health Information Security and Privacy Collaboration (HISPC)

In 2008 Missouri joined the third phase of the national HISPC initiative as part of two multistate collaboratives, participating alongside Florida, Kentucky, Louisiana, Michigan, Mississippi, Tennessee, and Wyoming in the Provider Education Toolkit (PET) Collaborative; and alongside Florida, Kansas, Kentucky, Michigan, New Mexico, and Texas in the Harmonizing State Privacy Law (HSPL) Collaborative.

Individuals representing over 40 stakeholder organizations participated in the initiative that was overseen by a public-private Steering Committee representing health care providers, patients, health plans, state agencies, private health care systems, and special interest groups. The project was staffed by the State's quality improvement organization (QIO), Primaris. Six stakeholder meetings were conducted across the state to educate key stakeholder groups around the privacy and security safeguards provided by EHRs and HIE.

The HSPL Collaborative developed an in-depth analysis of Missouri state laws around privacy and security of medical information, which was then entered into a comparative analysis matrix of the laws in all HSPL states. Because both Missouri and Kansas participated in this collaborative, both now have a side-by-side comparison of state privacy and security laws, and can identify gaps that must be addressed to facilitate interstate HIE in greater Kansas City – a major bi-state medical trading area. The PET Collaborative designed and tested messaging to raise awareness among providers of the benefits of safe and secure HIE. The messages were pilot tested with primary care physicians in the state, and the HISPC Phase 3 Extension provided the opportunity to extend outreach to additional provider groups. These tools, frequently asked questions (FAQs) and other resources developed as part of the national HISPC process are available online at http://www.mosecure4health.org/.

Hospital Collaboration

Through the Missouri Hospital Association (MHA) and the Hospital Industry Data Institute (HIDI), Missouri hospitals are actively involved in AHRQ, HCUP, CDC, and various American Hospital Association (AHA) initiative. HIDI has existing partnerships with eight other state hospital associations.

Statewide HIE Coalition

Missouri is an active participant in the Statewide HIE Coalition, a coalition of states and State-Designated Entities that is designed to provide a forum for its members to share their experiences with statewide HIE, including their experiences leveraging ARRA's various funding streams and provisions, and to enable members to identify and advocate for federal policies that will support successful statewide HIE.

3. GOVERNANCE

3.1 Overview

Historically, Missouri's public and private HIE initiatives have been initiated and operated independently, without official coordination or alignment at the state or regional levels. Missouri recognizes that statewide HIE requires governance, leadership, and accountability around the management of the HIE infrastructure, privacy and security, and a mechanism for consumer and provider participation. Missouri seeks to enable statewide HIE governance that enables the development and adoption of consensus-based principles and policies to meet the broad needs of consumers and health care organizations involved in HIE, and the corresponding ability to establish accountability and track progress of the statewide HIE initiative to ensure that Missouri's providers and patients realize the benefits of HIE.

As part of the strategic planning process, MO-HITECH and the Governance Workgroup reviewed governance approaches of other states, identifying lessons and experiences to inform Missouri's approach to governance of statewide HIE. Three main governance approaches were considered:

- **Market-driven** – State defers to regions
- **Not-for-profit governance entity** – Independent entity with State participation
- **State-led** – State government led, supported by a collaborative, multi-stakeholder policy process

The market-driven approach is not unlike the approach to date in Missouri and much of the nation pre-dating the HITECH Act. Without a statewide, coordinated governance and policy initiative, individual HIE initiatives have evolved to respond to local or regional market demands, but have not been coordinated at a greater state or national level. Such initiatives have often been challenged by a lack of sufficient resources to deploy and support health IT adoption among providers. Given the complexity of the health care environment and fiscal challenges that the industry faces, the market-based approach may not be as efficient as a statewide approach to support interoperability, public health goals, and stakeholder-based consensus.

In contrast to a market-driven approach, the State or an independent not-for-profit governance entity may oversee statewide HIE, coordinating HIE efforts and enabling the development of statewide policy guidance. When the State oversees HIE governance, an office or agency within State government must be trusted to oversee and manage the statewide process. Such a State-led approach may afford for less flexibility and efficiency in a state as large and diverse as Missouri.

Therefore, it is the strategy of the State of Missouri and MO-HITECH that an open and transparent multi-stakeholder public-private partnership should be charged with convening a statewide collaboration process to govern HIE in Missouri. This statewide governance organization – hereafter referred to as the Statewide HIO -- will have involvement by State government but will not be a State agency. Instead, the Statewide HIO will be a not-for-profit corporation in which stakeholders come together to create trust in HIE in Missouri through the business, technical, and operational policies they adopt and agree to adhere to. The Statewide HIO will also provide oversight and accountability for HIE in Missouri. The State will have a permanent role in statewide HIO governance and certain authority to ensure that the Statewide HIO operates in the public interest. This approach, characterized by a collaborative stakeholder process, ensures that public health goals, as well as the goals of patients, providers, payors, and the State, will be addressed in the public-private governance process.

Missouri recognizes that an incremental approach is necessary to realize the benefits of its governance strategy. This section of the Strategic Plan will describe certain precise elements of MO-HITECH's governance strategy, and how the governance strategy relates to the other principal domains of MO-HITECH's HIE strategy and to the HIE strategies of other federally-funded health programs in the state.

The future Operational Plan will set forth details as to the implementation of the statewide HIE governance strategy.

The MO-HITECH governance strategy is a core policy lever that will ultimately be a lynchpin in creating an environment that will help incentivize "trading partners" of providers as well as consumers to demand HIE and hence spur private sector innovations in the field.

3.2 The Process to Date

Organized efforts to build consensus around a governance strategy for statewide HIE in Missouri began in the summer of 2009. The Missouri Departments of Social Services and Health and Senior Services organized HIE Listening Sessions around the state to gather opinions and test hypotheses regarding a range of issues relative to HIE including governance models. With the assistance of the Missouri Foundation for Health and the Health Care Foundation of Greater Kansas City, the State engaged advisors and studied governance models used by statewide HIOs in other states.

A vision emerged for statewide HIE (see Section 1.1, Missouri Vision and Objectives), and around that vision the State engendered a policy process through the issuance of the MO-HITECH Executive Order and the appointment of Ronald J. Levy, Director, Missouri Department of Social Services as the Health IT Coordinator for the State.

Pursuant to the MO-HITECH Executive Order, MO-HITECH convened a Governance Workgroup that is meeting regularly to define principles and strategies for governance of the Statewide HIO. The Governance Workgroup is open to all interested stakeholders; its meetings to date have been well attended and its deliberations have been serious and wide-ranging. The Workgroup's meeting materials and meeting summaries are accessible online at http://dss.mo.gov/hie/leadership/governance/meetings.shtml.

The Governance Workgroup will continue to meet and develop concrete operational recommendations to implement the overall Statewide HIO governance strategy described in this section. As with the other Workgroups, the Governance Workgroup's recommendations are presented to the MO-HITECH Advisory Board for review and consideration, and ultimately to MO-HITECH and the State for approval.

3.3 Strategic Governance Functions of the Statewide HIO

Statewide health information exchange will be governed by a collaborative multi-stakeholder organization -- the Statewide HIO -- in which the State plays a role and over which the State retains certain authorities.

Through collaboration and deliberations within the Governance Workgroup established pursuant to the MO-HITECH Executive Order, consensus has emerged among the State and its stakeholders that the Statewide HIO should be charged with carrying out the following strategic functions, all with the ultimate goal of improving patient care:

- Define clear and consistent goals for statewide HIE
- Define and adopt business, technical, and operational policies that participants comply with as members of a self-regulatory organization
- Act as the agent for distribution of state and federal grant funds for statewide HIE development
- Ensure the availability of statewide technology services
- Coordinate with Missouri's Regional Center
- Establish business models for a sustainable, self-financing Statewide HIO

- Have the authority to ensure compliance, enforce policies and resolve disputes relating to participation in the Statewide HIO (and in compliance with national and state laws and regulations)

Notably, the Governance Workgroup and MO-HITECH must coordinate closely with parallel Workgroups regarding the implementation and implications of the above functions proposed for the Statewide HIO. For example, the Governance Workgroup must work closely with the Legal/Policy Workgroup to address implementation of the Statewide HIO's authority to ensure compliance and enforcement of policies.

Services required by this strategy may or may not be implemented by the Statewide HIO; however, the Statewide HIO will take responsibility for assuring that implementation occurs consistent with policy objectives.

Missouri's strategy will be to utilize the statewide collaboration process convened by the Statewide HIO to build consensus around policies that have wide support among stakeholders and can achieve policy objectives such as:

- Fostering the development of standards-based HIE technology that is vendor-agnostic and adaptable; and

- Developing privacy and security policies that engender trust on the part of patients, providers, payers and other data users and data services.

The future Missouri HIE Operational Plan will provide details with respect to the implementation of the specific functions that the Statewide HIO will undertake.

By engendering a multi-stakeholder statewide collaborative process and carrying out its assigned functions in an open, transparent and accountable way, the Statewide HIO will create an environment of trust and collaboration and support the development of tools that will enable the state's providers to be able to satisfy meaningful use criteria and achieve the goals, objectives, and measures related to statewide HIE.

3.4 Organization of Statewide HIO

MO-HITECH will designate a new organization to serve as the Statewide HIO so that the strategic functions will be housed in a qualified organization that is broadly representative of Missouri's stakeholders, transparent, and accountable.

The Statewide HIO will be organized pursuant to a certificate of incorporation and bylaws (the Constitutive Documents).

The Constitutive Documents will provide for the following organizational precepts:

- The board of directors (the "Board") of the Statewide HIO will be self-perpetuating (i.e., the Statewide HIO will not have members, and the Board will elect its own successors).

- The Board will be made up of 12-20 members.

- The certificate of incorporation will name the initial Board members. The initial Board members will be approved by the MO-HITECH Advisory Board. These initial Board members will serve for an initial term of one year. Thereafter, the Board will be classified into three classes, so as to "stagger" the terms of Board members. Ultimately the term of each Board member will be three years.

- No Board member may serve more than two consecutive terms.

- The persons serving as the directors of the State Departments of Social Services and Health and Senior Services will be permanent Board members (and will be exempt from the two-term limit).

- At all times a majority of the Board seats (not including vacancies) must be filled by providers and consumers.

- Vendors will not be eligible to serve on the Board (but may be invited to participate in work groups or advisory bodies established by the Board).

The bylaws of the Statewide HIO will set forth the characteristics that candidates for Board membership should have, and will establish the objective that the Board composition should evidence ethnic, cultural, geographic, racial and gender diversity.

The Constitutive Documents will provide that nominees for Board membership will be proposed by a nominating committee (the Nominating Committee) named by the Board. The Nominating Committee will charged with nominating candidates such that:

- The requirements of the Constitutive Documents regarding broad stakeholder representation and majority representation of providers and consumers are respected;

- Ethnic, cultural, geographic, racial and gender diversity are manifested in Board membership;

- Openness and transparency is achieved in the nominating process including through the solicitation of applications for nominations; and

- No one industry group is disproportionately represented on the Board.

Members of the Nominating Committee will not be eligible to be candidates for election to the Board.

The Board will have the authority to establish working groups comprised of subject matter experts to support the Board's activities, as well as advisory bodies with general or specific agendas. It is expected that initially many if not all of the Working Group established by the MO-HITECH Advisory Board will migrate into the working group structure of the Statewide HIO.

The Statewide HIO will have an executive director and a strong staff, which will support and integrate the activities of the working groups and the Board itself.

3.5 Authority and Involvement of the State

Statewide HIE must develop in a way that is fully consistent with public health and public policy objectives. The State is examining the mechanisms and legal issues associated with assuring that the State retains appropriate oversight authority with respect to the Statewide HIO. While it will be essential to maintain the integrity of the multi-stakeholder collaborative process in setting policy for the HIO, it is also the case that the State has a non-delegable role as the steward of State assets and the protector of the public interest that must be preserved.

The State has determined that State officials may serve as Board members of the Statewide HIO provided that no compensation is paid for such service. The State is examining whether it has the authority to enter into a contract with the Statewide HIO for the provision by the Statewide HIO of services that advance public policy objectives. If as expected the answer is affirmative, then the State will determine whether the contract for such services must be let through a procurement process in accordance with applicable regulations, or if the Statewide HIO would meet the criteria for a "single feasible source" contract (which would mean that the procurement regulations would not apply).

Assuming that the State may lawfully enter into a contract with the Statewide HIO, such a contract is expected to be the vehicle for the transfer of funds by the State to the Statewide HIO for specific purposes approved by the State (including funds provided under the State's cooperative agreement with HHS pursuant to the FOA). As part of such a contract, the State would have the authority (and is expected) to reserve the right to approve decisions made by the Statewide HIO that would be implemented using funds transferred to the Statewide HIO by the State.

Funds that are proposed to be transferred by the State to the Statewide HIO must first be appropriated by the State Legislature for expenditure for HIE purposes.

The State is continuing to examine the State law issues associated with the activities of the Statewide HIO and the State's relationship with the Statewide HIO, including the subjects addressed above and other subjects such as the applicability to the Statewide HIO of the State's Sunshine Law. The future Missouri HIE Operational Plan will provide details as to the results of these examinations.

3.6 Role of the State Health IT Coordinator and Coordination with Other State Programs

In the MO-HITECH Executive Order, the Governor of Missouri established the Missouri Office of Health Information Technology (MO-HITECH) and appointed Ronald J. Levy, Director, Department of Social Services, as the Health IT Coordinator for the State of Missouri to lead MO-HITECH.

The MO-HITECH Executive Order established a strategic policy direction whereby the State's Health IT Coordinator is responsible for ensuring the coordination, integration and alignment of statewide HIE with the State's Medicaid agency and functions and with the State's public health programs.

This strategy will be implemented through regular and institutionalized coordination and reporting mechanisms overseen by the Health IT Coordinator. In particular, the Health IT Coordinator will be responsible for coordination of the State's Medicaid Strategic Plan with the strategies of the Statewide HIO. The future Missouri HIE Operational Plan will provide details as to the implementation of this strategy.

3.7 Coordination with Other Domains

The Statewide HIO will establish workgroups to ensure that its activities in the areas of finance, technical infrastructure, business and technical operations, legal/policy, and consumer engagement will be integrated and coordinated through a unified governance framework. The Board and staff of the Statewide HIO will integrate and coordinate the work of the workgroups.

Missouri is analyzing how best to preserve and enhance the value created by existing regional HIOs in the State (see Section 2, Environmental Scan) within the context of statewide HIE.

3.8 Accountability and Transparency

MO-HITECH's strategy to achieve accountability and transparency in the governance of statewide HIE is to establish clear and measurable goals and regularly assess progress in achieving them, and to encourage the widest possible stakeholder involvement in the Statewide HIO.

Among the benchmarks that the Statewide HIO is expected to establish for itself are:

- Extent and breadth of stakeholder involvement in the Statewide HIO at the Board and workgroup levels
- Measurement criteria for determining extent of statewide coverage enabling providers to satisfy meaningful use criteria

- Specific mechanisms for coordination with Medicaid and other federally-funded state programs
- Regularity of reporting and breadth of dissemination of reports

MO-HITECH also recognizes the importance of flexibility and the ability of the Statewide HIO to evolve to meet developing needs in the marketplace. The governance functions of the Statewide HIO will be called on to demonstrate an institutionalized ability to change and grow to assure that HIE in Missouri meets the needs of all citizens of the State.

4. CONSUMER ENGAGEMENT

4.1 Overview

MO-HTECH is committed to utilizing health IT and HIE to empower Missourians to take a more active role in their own health care. While consumer engagement is not identified as a domain in the FOA, MO-HITECH believes that effective consumer engagement will be essential to the success of HIE in Missouri.

In working to design and implement initiatives to advance the exchange of electronic health information, it is crucial that patients are educated and able to make well-informed decisions about their own health and participation in HIE. The MO-HITECH Consumer Engagement Workgroup will engage consumers and consumer representatives to facilitate consumer input in the planning, as well as operation, of HIE statewide on an ongoing basis. The Consumer Engagement Workgroup, comprised of consumers, consumer advocates, and representatives from the public, private and non-profit sectors, will help MO-HITECH ensure that consumer perspectives are integrated throughout the strategic and operational planning process by:

- Developing consumer oriented principles and policy priorities for HIE activities in Missouri;
- Working with consumer advocacy groups to understand needs relative to HIE and communicating opportunities for consumer involvement and input;
- Developing a detailed plan for ongoing consumer engagement; and
- Advising the State in the creation of effective communications to the greater public.

Following its launch in December 2009, the Consumer Engagement Workgroup has initiated the activities under its charge and gained consensus on several key issues. MO-HITECH will continue to work to assure that the perspectives of special populations and under-represented constituencies are captured.

4.2 Principles

To guide Missouri's HIE planning activities and provide a framework for evaluating decisions with consumers' interests in mind, MO-HITECH will develop a set of key principles that address:

- Transparency of policies and practices relating to health IT/HIE;
- Consumer access to health IT tools and personal health information;
- Confidentiality and informed consent in use of health information;
- Data integrity and security safeguards for health information;
- Oversight and enforcement of remedies for any security breaches or privacy violations; and
- Ongoing outreach and education efforts to proactively engage consumers.

Based on study and review of existing consumer engagement models put forward by national organizations and other states, the Workgroup has engaged in a robust discussion on these issues and identified key features for Missouri's principles, which are listed below. Overall, the principles emphasize maximizing value, improving the quality and safety of care, and enhancing the public's health. The principles are currently undergoing review by the Advisory Board.

- *Transparency of policies and practices relating to health IT/HIE* – Individuals should be given notice of their full rights, the terms under which their information is being accessed, by whom their personal health information is being accessed and for what purposes the information is being used. Missouri's policies relating to health information exchange should be established in an open and transparent process in collaboration with consumers.

- *Consumer access to health IT tools and personal health information* – Individuals should have secure, convenient access to their personal health information, including access by a designated proxy.

- *Confidentiality and informed consent in use of health information* – Individuals should be made aware of and consent to the purposes for which personal data are collected and used. Personal data should not be disclosed, made available, or otherwise used for purposes other than those specified. Individuals should have control over whether their personally identifiable health information is shared.

- *Data integrity and security safeguards for health information* – The collection and storage of personal health data should be limited to that information necessary to carry out the specified purpose: maximizing efficiencies and affordability, improving the quality, safety, and continuity of care, and improving the public's health. Appropriate safeguards should be in place to preserve confidentiality and security of personal health information.

- *Oversight and enforcement of safeguards for any security breaches or privacy violation* – Individuals should be notified in a timely manner of any breaches or violations and have access to an audit log of activity relative to their personal health information, as well as meaningful enforcement activities.

- *Ongoing outreach and education efforts to proactively engage consumers* – Implementation of a statewide electronic health information network should include a significant consumer education initiative so that people understand both the value of the network and the rights, benefits and remedies afforded to them. These efforts should include outreach to vulnerable and hard to reach populations.

Ultimately the Consumer Engagement Workgroup will coordinate with the appropriate parallel Workgroups to ensure implementation of the final principles.

4.3 Consumer Engagement Strategy

With the key principles serving as a foundation, Missouri has developed a four-pronged strategy for consumer engagement in MO-HITECH's HIE planning and implementation processes involving:

- Environmental scanning to catalogue current efforts and unmet needs and evaluating the process and impact of future consumer engagement efforts;

- Capacity building of both public and private resources to ensure informed consumer representation in policy development, planning and implementation processes;

- Capacity building and targeted assistance to public and private resources to enable effective engagement of consumers on a broad basis, as well as focus on hard-to-reach populations; and

- Developing consumer education, outreach, and communications initiatives and materials, including targeted initiatives and materials for hard-to-reach populations.

MO-HITECH, with guidance from its Advisory Board and Consumer Engagement Workgroup, will drive the consumer engagement strategy and inform the activities to be conducted. Activities contemplated

under Missouri's consumer engagement strategy include:

- Convening roundtables and focus groups to gain consumer feedback;
- Ensuring consumers have strong representation on the Board of the Statewide HIO;
- Appointing a dedicated consumer advocacy staff member to manage and coordinate daily activities;
- Appointing a Consumer Advisory Council to provide ongoing input and review to the MO-HITECH Advisory Board and staff;
- Establishing funding resources to empower stakeholder organizations in consumer engagement; and
- Conducting traditional and social media, and other public outreach campaigns to educate consumers; Faith-based organizations, and federally qualified health centers (FQHCs) are two potential vehicles of communication that may be used to reach non-traditional consumers.

MO-HITECH notes the fundamental link between patients and providers and the critical role of providers in consumer engagement, and will assure coordination of these efforts with the Regional Center and provider adoption strategies.

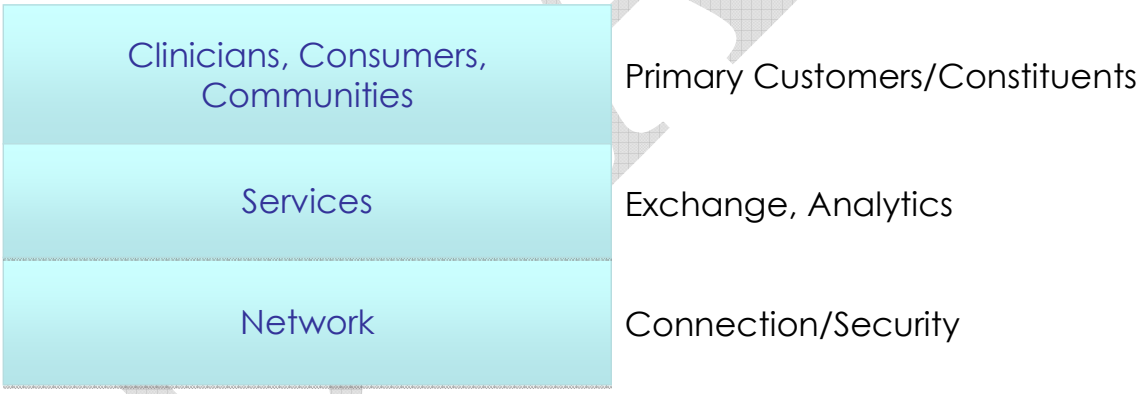
5. TECHNICAL INFRASTRUCTURE

5.1 Overview

Missouri's approach to developing a statewide technical infrastructure rests on assumptions that are often characterized by the phrase "changing the tires at 65 miles an hour." That is, new work must proceed quickly yet leverage the substantial investments in existing public and private systems. New systems and processes put in place must be flexible and adaptable to an ever-changing environment. Further, the environment is a full-scale production environment where individuals' health and well being may be on the line. Creating robust statewide HIE in the midst of this environment is a significant challenge and Missouri is placing substantial effort into the design of a technical infrastructure capable of managing systems and processes within this dynamic health care environment.

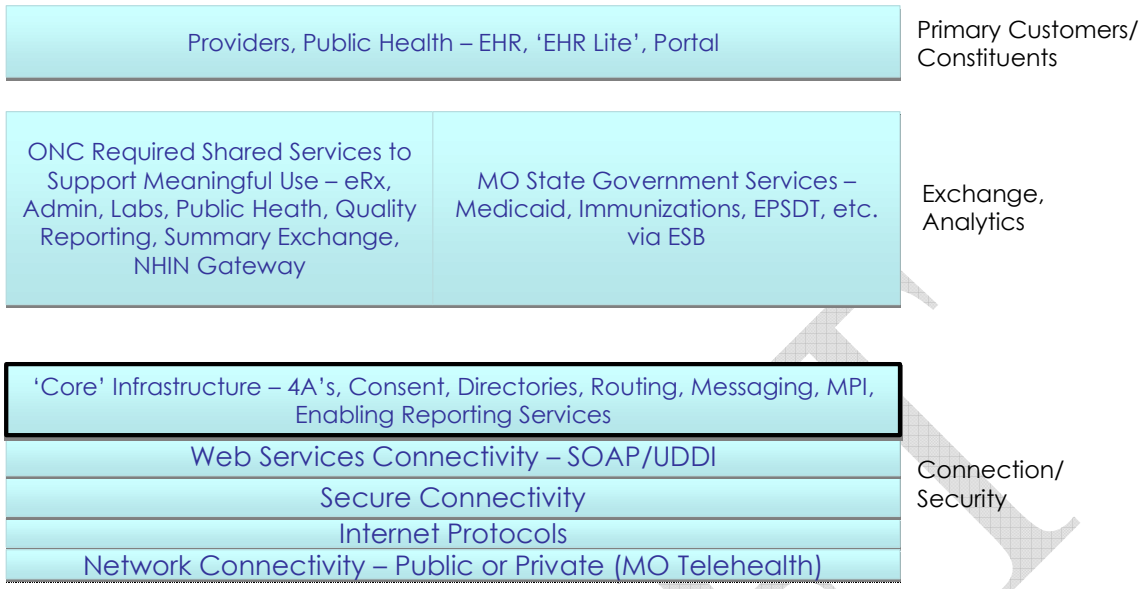
Missouri intends to establish a Statewide HIO and to leverage and support the development of regional HIE efforts and other regional and community based HIOs. There will be both technical and policy challenges to this hybrid approach. However, such an approach follows the successful design of the Internet, enabling local governance and customization to effectively address complex community needs, while gaining advantages of access and efficiency through services offered by the Statewide HIO. For example, the Statewide HIO can provide efficient access to interstate exchanges such as the NHIN and economies of scale for widely deployed intrastate services such as provider directories. The Statewide HIO can also serve as a guarantee that all areas of Missouri have access to statewide HIE services where no local HIO exists, and also by coordinating efforts to deploy broadband infrastructure and other essential capabilities to enable access to statewide HIE services. Finally, the Statewide HIO will work with the state government to integrate valuable information assets including investments of the state Medicaid program, the statewide immunization registry, and others.

Figure 8. Layered architectural approach



Missouri's statewide technical infrastructure is based on a layered architectural approach shown in simplified form in Figure 8. The foundation layer consists of backbone network connectivity and "Core Infrastructure" services such as security and directories. The middle layer defines statewide HIE services as required by ONC and MO-HITECH's collaborative stakeholder process, specifically the active Technical Infrastructure and Business and Technical Operations Workgroups. This layer also enables HIE with state government information assets, which are quite substantial. Finally, the top layer describes how end customers obtain access to statewide HIE services. Figure 9 below presents a more detailed diagram of this architectural approach.

Figure 9. Detailed architectural approach.



Missouri's technical approach emphasizes creating statewide HIE services that provide significant patient value and support providers to meet meaningful use requirements. A strategy that relentlessly pursues patient and clinician value will drive adoption among health care providers and public health officials, the two primary targets of initial HIE efforts. It will also maintain the focus of technical efforts on improved patient outcomes so that technology decisions are made in the proper context of the ultimate goals of this effort.

The remainder of this section contains greater details around the proposed technical approach. The following three subsections describe the principles, processes, and patterns that together define the technical architecture. Finally, statewide HIE services will be defined at a high level with emphasis on the "Core Infrastructure" within the foundation layer of Figure 9. Services that are part of the middle layer are defined in Section 5, Business and Technical Operations.

5.2 Principles

The following principles provide guidance for decision making and will be followed to achieve a statewide technical architecture that is both flexible and adaptable.

- **No Provider Left Behind**. The technical infrastructure will be designed and implemented to enable access by all participants/providers in Missouri. Attention will be paid to ensure that providers in rural communities and other areas where technical infrastructure may lag will have access to statewide HIE services.

- **Align with Meaningful Use**. Statewide HIE services will prioritize support for providers attempting to satisfy meaningful use criteria as defined by CMS in its final rule.

- **Leverage Everything Possible/Avoid Creating Redundant Services**. Missouri has made substantial investments in health IT that should be integrated and leveraged to the greatest extent possible to support statewide HIE. Services available within Missouri or elsewhere that can provide needed functionality should be utilized if possible.

- **Design for Cross State Border issues**. Missouri borders eight states and has major metropolitan areas on state borders. Every effort must be made to create statewide HIE that

functions across state borders to enable effective healthcare for patients and providers in border regions. Missouri will be a part of the NHIN, either through regional deployments as part of NHIN-sponsored projects or through a NHIN gateway provided by the Statewide HIO.

- **Make All Services Available to All**. Technical consumers of statewide HIE services will have access to any services from any point in the network. Providers and other end customers should only have to connect once into the statewide network to obtain any service and should not face any other barriers to access including price premiums.

- **Design for Change**. Systems, applications, and standards used in HIE are guaranteed to change on a regular basis. The technical infrastructure will be designed to be resilient to these changes.

- **Start with National Standards and Minimize Deviation**. The technical infrastructure will comply with national standards unless necessary to satisfy Missouri-specific legal or regulatory requirements, or if there is consensus among the Technical Infrastructure Workgroup, Advisory Board, and MO-HITECH that deviation from national standards is necessary.

- **Use of Open Protocols**. The technical infrastructure and approach will adopt open protocols to maintain interoperability and vendor neutrality.

- **Utilize engineering best practices:** The technical infrastructure should follow best practices in implementation for critical production systems, including scalability and reliability.

- **Consider Impact on Underserved**. Decisions about technical design will consider the impact, both positive and negative, on underserved populations to emphasize improved health care outcomes for underserved populations.

5.3 Patterns/Technical Approach

Service Oriented Architecture[8] (SOA) will be the primary architectural pattern and the use of an Enterprise Service Bus (ESB) pattern is under consideration. These patterns are based on the fundamental notion of a protocol-based platform. The ESB pattern adds a consistent interface for mediation between service providers and consumers. It includes at a minimum the use of a registry of services to enable dynamic lookup and binding of service endpoints by service consumers, and translation capabilities to simplify use of the SOA by both providers and consumers. This approach is derived from the current work on the NHIN that is based on HHS standards. As stated under the principles above, the goal is to remain compliant with HHS standards while facilitating meaningful use.

5.4 Services

The Technical Infrastructure Workgroup is working in close collaboration with the Business and Technical Operations Workgroup to define and prioritize statewide HIE services, as well as with the Legal/Policy Workgroup to address any policy issues or questions that may need to be addressed.

The Technical Infrastructure Workgroup is focused on the technical architecture and the definition of what has been designated “core infrastructure.” Core infrastructure includes broad capabilities that support a wide range of healthcare services such as directories, patient matching, and security. The Business and Technical Operations Workgroup has been assigned the responsibility for more specific clinical services such as e-prescribing and clinical summary exchange. HIE services are addressed in greater detail in Section 6.

[8] Service Oriented Architecture (SOA). For background information read the Wikipedia entry or this OMG paper on SOA in Healthcare

5.5 Core Infrastructure

Certain support infrastructure services are required to implement the proposed technical architecture. Among such required services are: support for the generation and management of digital certificates, monitoring of network activities, and testing. The details about these services will be included in the future Missouri HIE Operational Plan.

Services required by this strategy may or may not be implemented by the Statewide HIO; however, the Statewide HIO will take responsibility for assuring an appropriate implementation is achieved.

Figure 9 presents a summary of the approach as a layered architecture diagram. The Network and Connectivity layer forms the foundation. Secure connections are provided over the public Internet using the transport layer security (TLS) protocol with mutual authentication. Message connectivity is based on Web services standards such as the Simple Object Access Protocol (SOAP) and Universal Description, Discovery, and Integration (UDDI) registry.

The most significant part of this layer is labeled core infrastructure. These services provide essential capabilities to support health care transactions and in particular to support providers in satisfying meaningful use criteria related to HIE.

Directories are one of the important services identified by ONC to support statewide HIE. There are several types of directories that can be used to enable HIE:

- **Clinician/Provider/Facility**: The ability to identify the electronic address and other essential demographic information of providers is essential for several important clinical services such as public health alerts, refill requests from pharmacies, and various types of summary exchanges such as referrals or discharges. This directory may also contain facility information or it may be necessary to create a separate directory of facilities.

- **Pharmacies**: E-prescribing requires pharmacy electronic contact information to become ubiquitous in order to gain widespread adoption. Eligible professionals must be able to generate and transmit prescriptions electronically using certified EHR technology for at least 75% of permissible prescriptions to satisfy currently proposed 2011 meaningful use requirements.

- **Laboratories**: Similar to e-prescribing, laboratory ordering has high value for providers and is required for 2011 meaningful use; as currently proposed, the results of at least 50% of all clinical lab tests ordered must be incorporated into a certified EHR as structured data.

- **Health plans**: Electronic eligibility and claims transactions require that providers be able to send electronic information to health plans and vice versa. This is an important set of services because of meaningful use requirements, potentially significant cost savings, and improved productivity opportunities for providers. Eligible professionals and hospitals will be required to check eligibility and submit claims electronically to public and private payers for 80% of unique patients and claims, respectively, to meet currently proposed 2011 meaningful use requirements.

- **Master Patient Index (MPI)**: The Technical Infrastructure Workgroup has made accurate patient matching a high priority and therefore an MPI has been given increased importance. Missouri will consider existing capabilities that may be leveraged to accelerate development of a statewide MPI, such as the Departmental Client Number (DCN) (please see section 2.2 for a description of the DCN).

Core Infrastructure services layered on top of the directory services are in the process of being prioritized and the Workgroup is determining whether to propose the creation of statewide HIE services in the following areas:

- Security services including authentication, authorization and audit
- Consent management
- Secure messaging
- Enabling reporting services
- Subscriptions and notifications (also known as NHIN HIE Event Messaging)

6. BUSINESS AND TECHNICAL OPERATIONS

6.1 Overview

Missouri has unique capabilities and characteristics from which the strategy for prioritization and deployment of statewide HIE services derives. Missouri has early local and regional HIE services being developed by HIOs; this may be advantageous because these HIOs can more easily take advantage of statewide HIE services and accommodate any changes required to comply with common protocols and standards that will enable interoperability of HIE services throughout Missouri. Missouri also has significant information assets within state government that are well integrated due to efforts over many years, and this will make leveraging these assets much more straightforward.

Missouri shares a border with eight other states, creating substantial challenges in designing and deploying statewide HIE services as integration with these border states is very important. As a result, Missouri will adhere to national standards and intends to participate in the NHIN, providing access to all national services compatible with NHIN protocols and enabling robust border state HIE. Flexibility and adaptability are therefore critical features of the strategy at the system design level and in deployment.

Meaningful use requirements for providers will be a primary driver of strategy for prioritization and deployment of statewide HIE services. The services strategy detailed below is based on the CMS Notice of Proposed Rulemaking released on December 30, 2009. This approach may have to be modified depending upon final rules issued by CMS. In addition, the Business and Technical Operations Workgroup, in collaboration with the other workgroups, has identified additional services with enough patient and clinical value to be considered in the prioritization scheme.

Missouri will be a part of the NHIN, either through regional deployments as part of NHIN-sponsored projects or through a NHIN Gateway provided by the Statewide HIO.

6.2 Meeting Meaningful Use HIE Requirements

HIE Services

ONC Required Services from FOA

The following services are required for Stage 1 meaningful use; the descriptions and plans below are based on the Notice of Proposed Rulemaking (NPRM) for Meaningful Use.

- **E--Prescribing**. Emphasis will be on enabling the transmission of prescriptions for all providers and obtaining medication histories and fill status as these are proposed 2011 Meaningful Use requirements. If possible, all transactions will be implemented in the first phase including refill orders.

- **Eligibility and Claims Transactions**. Missouri already has a robust set of electronic data interchange (EDI) network vendors in place that can perform these transactions. The next step is to make these services available to all providers so they can satisfy proposed 2011 Meaningful Use requirements. This can be accomplished through expansion of vendors' connectivity, possibly through the Statewide HIO.

- **Electronic Lab Ordering and Results Delivery**. First, the Statewide HIO will work with laboratory providers and other HIOs to enable electronic results delivery into provider EHRs as this is a proposed 2011 meaningful use requirement. The next step will be to enable lab ordering by providers.

- **Public Health Reporting**. Missouri has an excellent state government infrastructure that is now being enhanced to support Web services and plans are under way to integrate through the

Statewide HIO using these Web services. Priority will be placed on the proposed 2011 meaningful use requirements: submission to the state immunization registry, syndromic surveillance, and reportable lab results.

- **Quality Reporting**. Missouri will support reporting CMS measures through the Statewide HIO, and may extend this reporting for state government purposes.

- **Summary Exchange**. Missouri will enable exchange of clinical information through standard formats over the network described in the Technical Infrastructure section (Section 4), with initial emphasis on modules within the CCD/C32 that support the proposed 2011 meaningful use requirements: problem list, medication list, allergies, test results, discharge summaries, procedures.

Additional Services

Missouri has identified services in addition to those required for meaningful use. The Business and Technical Operations Workgroup is reviewing and considering these additional services including the exchange of medical images, clinical summary exchange, and advanced administrative transactions. These additional services were valuable enough to merit consideration as part of the prioritized service list derived from the CMS requirements to support meaningful use.

6.3 Leveraging Resources

While there is some notion of prioritization in the order of the services above, a final prioritization for the plan cannot be completed until the proposed meaningful use definitions are finalized by CMS. Further, there is continuing dialogue in the Business and Technical Operations Workgroup and the Technical Infrastructure Workgroup that may alter prioritizations. The general strategy is to prioritize statewide HIE services that support proposed 2011 meaningful use requirements, and to work with the Technical Infrastructure Workgroup to ensure that core infrastructure services are aligned to support the prioritized clinical services.

Leveraging State and Regional HIE Capacity

Missouri's strategy calls for the creation of a Statewide HIO and to leverage and support existing and new regional or community HIOs. While most HIE efforts in Missouri are nascent, there have been substantial investments already in innovative approaches, and it is desired to integrate these efforts and enable them to continue to develop. The state currently has limited HIE capability at a statewide level. The state government has substantial integration capabilities within its systems and is currently developing a Web services architecture with an ESB. This will open up tremendous opportunities to leverage state government capabilities through statewide HIE.

Leveraging Statewide Shared Services and Directories

The section on Technical Infrastructure describes in detail the strategy for statewide directories and the approach to interoperability that makes all shared services available statewide. The Statewide HIO will adhere to this approach and other HIOs within the state will be assisted and encouraged to integrate via the protocols and procedures specified as part of the technical architecture. Representatives from the state government are closely involved in the process so that state government information assets will also comply with the specified guidance and therefore be integrated into the Statewide HIO.

The state government has one internal capability that is worth mentioning separately: the use of the Departmental Client Number (DCN) to link individuals across systems. It is estimated that approximately 50% of the state's population may be associated with a DCN, and every newborn is assigned a DCN as well as every individual that has an encounter with a state government health system if they do not already have one. It is therefore possible to use the DCN as a basis for a statewide MPI which was

identified as a high-value core infrastructure service.

6.4 Implementation Strategy

Incremental Approach

As noted in the overview, given that health care is already a substantial set of moving parts within Missouri, the most likely approach is an incremental one. The future Missouri HIE Operational Plan will lay this out in detail. At a high level, the strategy is to

- Perform a comprehensive environmental scan to obtain an accurate assessment of the current state.
- Finalize the prioritized list of statewide HIE services.
- Coordinate with other critical efforts, including the Regional Center, broadband deployment and state government work including the Medicaid MMIS and public health.
- Identify critical Core Infrastructure services needed to support prioritized HIE services and begin designing an approach to implementation immediately.
- Deploy prioritized HIE services in conjunction with support systems and adoption programs (and supported by a scalable and secure technical infrastructure).

6.5 NHIN Participation

Missouri is committed to NHIN participation. There are several projects within Missouri that are contemplating integration with the NHIN. In addition the creation of a package of Web services available through the Statewide HIO that would provide a gateway to the NHIN is planned.

7. Legal Policy

7.1 Overview

MO-HITECH is keenly aware of the new challenges and opportunities for protecting patient health information posed by statewide HIE. Recognizing that consumers will be reluctant to participate in HIE if they perceive risks to the confidentiality and/or accuracy of their personal health information, MO-HITECH plans to develop and require adherence to a consistent and coordinated approach to privacy and security that builds on the HHS Privacy and Security Framework Principles. The Principles provide, among other things, that:

- Consumers should be given a reasonable opportunity to make informed decisions about the collection, use, and disclosure of their individually identifiable health information;
- Individually identifiable health information should be collected, used, and/or disclosed only to the extent necessary to accomplish a specific purpose(s); and
- Individually identifiable health information should be protected with reasonable administrative, technical, and physical safeguards to ensure its confidentiality, integrity, and availability, and to prevent unauthorized or inappropriate access.

These principles are the foundation upon which MO-HITECH will build the trust necessary to realize the benefits of HIE in Missouri.

MO-HITECH's Legal/Policy Workgroup is leading the development of a comprehensive privacy and security framework for HIE in Missouri. The Workgroup includes representatives of hospitals, physicians and other health care providers, health plans, academia, technology vendors, regional HIE initiatives, and government. It has been meeting biweekly to develop this Strategic Plan, and will continue to meet on an ongoing basis to develop and inform the HIE Operational Plan.

The Workgroup has established a comprehensive process for developing privacy and security policies, that includes: 1.) identifying key legal and policy issues for consideration; 2.) considering and addressing issues related to consumer consent; and 3.) considering and addressing issues related to authorization, authentication, access, audit, and breach. As with the rest of the MO-HITECH Workgroups, the Workgroup will advance its recommendations to the MO-HITECH Advisory Board for review, adoption, and eventual incorporation into a governance/compliance structure, described briefly below. In addition to the development of privacy and security policies, the Workgroup will consider whether it is necessary or desirable to modify Missouri state health privacy laws and regulations; aid in the development of model trust agreements to enable data sharing among health care providers through our statewide HIE network; and engage neighboring states in efforts to harmonize the legal landscape in support of interstate HIE.

MO-HITECH is aware of the legal and policy issues surrounding HIE and the creation of a Statewide HIO, especially with regard to liability and appropriate uses of patient health information. These issues and concerns must be addressed to ensure the success and adoption of statewide HIE among Missouri's providers and hospitals. MO-HITECH is beginning to address such important issues at the outset of its efforts and recognizes that Legal/Policy Workgroup participants will be critically important to informing and guiding the approach and legal framework MO-HITECH will pursue. State attorneys from the Departments of Social Services and Health and Senior Services have been doing research for and advising the Workgroup on an ongoing basis. Recently, MO-HITECH retained experienced local counsel, Polsinelli Shughart PC, to ensure that the legal foundations and requirements for such issues as consent, privacy, and liability are addressed appropriately and with respect to Missouri case law. Attorneys in the Polsinelli firm are also working with other HIE efforts, and the firm has offices in a number of the cities that sit on the border of surrounding states. MO-HITECH does not underestimate the importance and gravity of this effort in the context of the greater statewide HIE effort.

7.2 State and Federal Privacy Landscape

Health privacy protection in Missouri is an amalgam of state and federal law, with the Health Information Portability and Accountability Act (HIPAA) providing the foundation, and specific state laws affording additional protections (e.g., to various classes of sensitive information) in certain instances. Understanding the manner in which a health care provider's disclosure of patient health information may be restricted by state and federal law is a key first step in developing a comprehensive privacy and security framework for HIE. Through Missouri's participation in the third phase of the national Health Information Security and Privacy Collaboration (HISPC), stakeholders have already begun this important work.

As part of the HISPC Harmonizing Privacy Law Collaborative,[9] Missouri worked with other participating states to develop a common subject-matter taxonomy to support comparison, analysis, and, where appropriate, reformation of state health privacy laws. Also as part of this effort, the Missouri Comparative Analysis Matrix was developed, constituting a preliminary analysis of Missouri health privacy law as compared to HIPAA and the laws of several other states.

Building off of the Comparative Analysis Matrix and another in-depth analysis of Missouri's health privacy laws prepared by the Missouri Hospital Association, the Legal/Policy Workgroup will continue to engage in a comprehensive review of the health privacy and legal landscape underpinning HIE in Missouri. This review will be inclusive of the HIPAA Privacy and Security Rules, ARRA's enhancements to the HIPAA Privacy Rule,[10] federal regulations governing confidentiality of alcohol and drug abuse patient records (42 CFR Part 2), and the HHS Privacy and Security Framework.

7.3 Development of a Common Privacy and Security Policy Framework

Taking into consideration the legal landscape for health privacy in Missouri, MO-HITECH will work to develop a comprehensive suite of privacy and security policies that protect privacy, strengthen security, and support the right of Missourians to have greater control over and access to their personal health information as it is exchanged through statewide HIE. These policies will address the full range of privacy and security needs for interoperable HIE, including: consent, authorization, authentication, access, audit, and breach.

The Legal/Policy Workgroup has already identified and begun considering a number of "threshold" issues – namely those related to consumer consent and appropriate uses and disclosures of information - that will influence the trajectory of MO-HITECH's privacy and security framework. These include determining what rights consumers should have to decide whether and how to permit the exchange of their health information through statewide HIE, and for what purposes such information should be used by the health care providers who are permitted to access it.

Preliminarily, the Workgroup has agreed that HIE for the purpose of sharing information among health care providers for treatment and quality improvement should be a first order priority, and that consent policies for the exchange of such information should serve as the minimum or baseline for consent. Further, the Workgroup has agreed that consent policies may differ when exchanging information for

[9] Individuals representing over 40 stakeholder organizations from throughout Missouri participated in the Harmonizing State Privacy Law Collaborative, which was overseen by a public-private steering committee representing health care providers, patients, health plans, state agencies, private health care systems, and special interest groups. Primaris, Missouri's Quality Improvement Organization, provided staff support. HISPC staff conducted six stakeholder meetings across the state to educate key stakeholder groups about the privacy and security safeguards provided by EHRs and HIE.

[10] The ARRA included a number of changes to the HIPAA Privacy Rule that will impact HIE, including the extension of HIPAA's regulation to RHIOs/HIEs as Business Associates, the requirement that consumers be able to request restrictions on disclosures of certain health information to payers, and other provisions that create new obligations on the health care providers, health plans, andhealth IT vendors that will participate in HIE in Missouri.

other purposes, and specifically that different consent protections may be required for sharing health information for marketing purposes, and for sharing clinical health information with payers. Finally, the Workgroup has agreed that public health uses should be enabled, to the extent they are mandated under current law.

Through the Workgroup, the State will consider whether to develop a statewide approach to consent (including common consent forms) or whether different regional, intrastate HIEs should be allowed to implement different approaches, recognizing that stakeholders have a range of preferences. For certain uses of information (*e.g.* treatment), some stakeholders may believe patient consent will be unnecessary. Others may believe that notifying consumers that their information may be disclosed will be sufficient. Still others may prefer an opt-out approach to consent, in which consumers are given the ability to "opt-out" of having their information exchanged upon receiving notification of such exchange. Finally, some may prefer an "opt-in" model, in which consumers must provide affirmative consent before their information may be disclosed to and/or accessed through the statewide HIE network. Finding the right balance between granting consumers the right to decide whether to share their information, and ensuring that health care providers have access to the information they need at the point of care, will require a strong commitment to compromise and collaboration.

In developing a privacy and security framework, stakeholders will also have to consider whether consumers should be able to limit provider access to certain types of data available through the exchange, and whether it is necessary to consider or develop new policies within the confines of the existing legal framework to facilitate HIE.

In addition to developing an appropriate consent model, Missouri will establish policies to address the "Four As" of privacy and security: authorization, authentication, access, audit and breach. Specifically, the State will develop policies that set forth minimum requirements that HIE participants should follow when: authorizing individuals to access information through Missouri's statewide HIE network; authenticating individuals prior to allowing them to access information through the network; enabling authorized individuals to access information through the network (*e.g.* in accordance with patient consent if required); logging and auditing access to health information through the network; and addressing breaches of information through the network, including notifying consumers and government agencies in the event of a breach.

Missouri's statewide privacy and security policies will be designed in a manner to allow incremental development of HIE policies over time, and to meet state and federal policy requirements, such as those related to public health and vulnerable populations.

7.4 Oversight of Information Exchange and Enforcement

As Missouri develops statewide privacy and security policy and procedures, it will provide health care providers and other stakeholders engaging in HIE with guidance about the proper construction of data sharing agreements.

As described in the Governance Section (Section 3), MO-HITECH, through its public/private collaboration process, will consider implementation of mechanisms to ensure that those exchanging health information comply with MO-HITECH's privacy and security framework. This could include leveraging the contracts the State will employ to disburse HITECH's HIE implementation grant, or the development of new legal/regulatory compliance structures.

7.5 Efforts to Enable Interstate HIE

The ability to share information about patients across state lines so that clinicians providing treatment can have the most complete information at the point of care is a key requirement of successful HIE. Consumers in Kansas City and St. Louis often obtain care in Kansas and Illinois respectively, making the need for cross-border HIE extremely important. In addition to developing intra-state privacy and security

policies and procedures, Missouri, through the Legal/Policy Workgroup, will work to evaluate the policies, laws, and regulations of Missouri's neighboring states with an eye toward harmonizing them to enable interstate HIE. Missouri also intends to comply with national standards and participate in the NHIN, facilitating HIE among Missouri and other NHIN participants.

Having worked with Kansas as part of the HISPC Harmonizing State Privacy Law Collaborative, Missouri will be able to leverage a comparative analysis of Missouri and Kansas confidentiality laws, as well as a preliminary understanding of the differences that must be reconciled to enable neighboring states to share information across state lines. The Legal/Policy Workgroup will leverage this work as it considers a broader framework for interstate HIE that will enable Missouri's health care providers to share information with providers in the eight states it borders. The Legal/Policy Workgroup will reach out to Missouri's border states to begin discussions about common definitions, policies, laws and regulations to enable interstate exchange of health information.

8. FINANCE

8.1 Overview

The passage of ARRA and the HITECH Act have significantly impacted the HIE financing landscape, creating an opportunity for providers to capture billions of dollars in meaningful use incentives that prioritize connectivity, care coordination, and quality reporting, as well as over $500 million to support state HIE planning and implementation. The state of Missouri is eligible for up to $13.77 million in Federal funds from the latter opportunity, the State HIE Cooperative Agreement program. In addition, administrative matching payments are available to state Medicaid programs to pursue initiatives encouraging the adoption of EHRs and promoting HIE and improvements in health care quality. Such matching payments, state grant funding, and meaningful use incentives are one-time funding opportunities that the state of Missouri is committed to pursuing to ensure its providers and patients realize the value of HIE.

Historically, there has not been a viable market to support HIE and existing regional and state HIOs have struggled to secure the up-front capital and develop recurring revenue necessary to support ongoing operations and connectivity. The HITECH Act is changing the marketplace; ONC recognizes that "Medicare and Medicaid meaningful use incentives are anticipated to create demand for products and services that enable HIE among eligible providers….The resulting demand for HIE will likely be met by an increased supply of marketed products and services to enable HIE, resulting in a competitive marketplace for HIE services."[11] To date, no single financing strategy for HIE efforts has emerged as the clear path to viability; rather individual HIE efforts must examine and understand the opportunities, constraints, and limitations inherent to various funding sources in the context of their unique markets.

Recognizing that a statewide financing approach will be both challenging and require input from diverse stakeholders and participants in the health care market, MO-HITECH has convened a collaborative stakeholder workgroup to develop and pursue a financing approach which will inform the state's understanding of and ability to plan for costs and revenues associated with HIE. Ultimately it will be the role of the Statewide HIO to ensure the availability HIE services or connectivity as determined necessary to support Missouri's providers pursuit of meaningful use. The Statewide HIO will also be responsible for establishing a sustainability model to ensure that the HIO is viable and capable of delivering on its long-term commitment to Missourians.

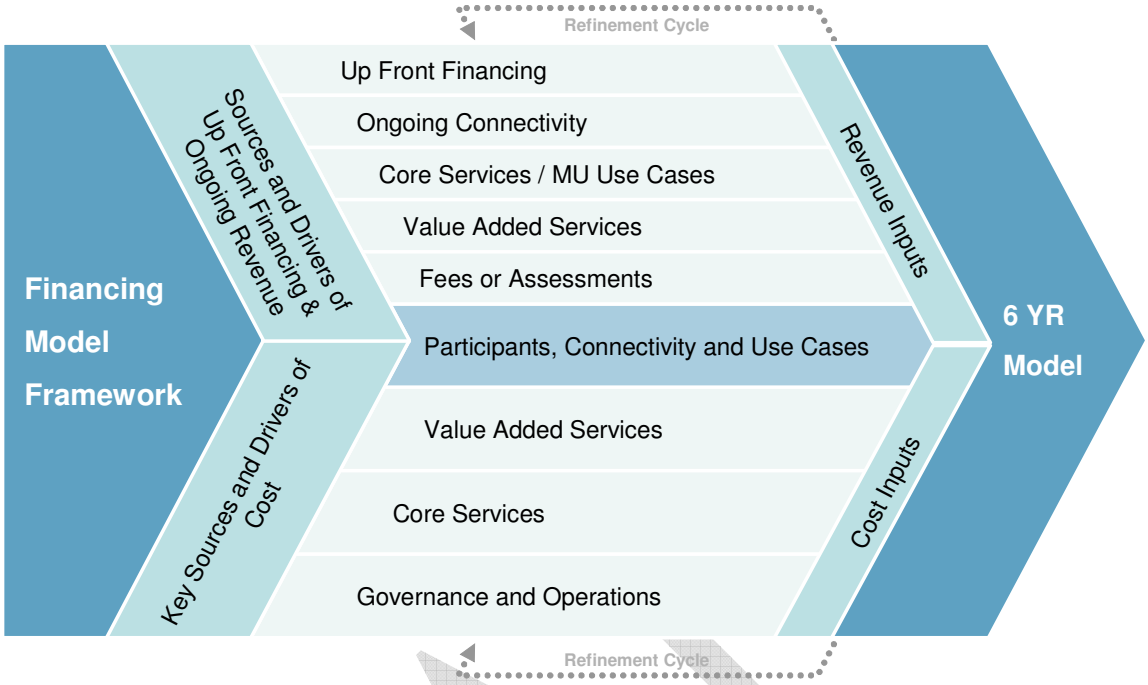
As an initial step in fulfilling its charge, the Finance Workgroup will work with MO-HITECH and state staff to review and update the proposed project budget that was included in the State's application to ONC's HIE Cooperative Agreement Program. The proposed $13.77 million budget will be examined to ensure that its assumptions and estimates remain aligned with the MO-HITECH's decisions, particularly those specific to the Statewide HIO's technical approach as developed and refined by the five parallel MO-HITECH Workgroups.

8.2 Financing Approach and Key Assumptions

MO-HITECH is supporting a collaborative stakeholder workgroup to address the need for sustainability and develop a model to estimate the costs of statewide HIE over six years (beginning January 1, 2010). The financing approach addresses the sources and drivers of cost, as well as the sources and drivers of up-front financing and ongoing revenue. The model's key assumptions and its cost and revenue components are described in greater detail below. Figure 10 below depicts the financial model approach.

[11] American Recovery and Reinvestment Act of 2009, Title XIII - Health Information Technology, Subtitle B—Incentives for the Use of Health Information Technology, Section 3013, State Grants to Promote Health Information Technology. State Health Information Exchange Cooperative Agreement Program. Office of the National Coordinator for Health Information Technology, Department of Health and Human Services. 2009. p. 9.

Figure 10. Financial Model Approach



The Finance Workgroup has reviewed and is refining the financing approach to reflect the vision of statewide HIE in Missouri and to take into consideration unique needs of Missouri providers. The approach currently relies on a baseline set of key assumptions:

- Governance and operations costs will focus on the Statewide HIO, not the individual governance and operations of any regional or local HIOs.
- The cost of participants' connectivity to the HIE will be based on adoption estimates that may vary by participant type (*e.g.* solo provider, critical access hospital, FQHC).
- The cost for participants to implement new EHRs or remediate existing clinical information systems (CIS) is not included in the cost of statewide HIE, with the exceptions of:
  - Medicaid system implementation or remediation required for statewide HIE; and
  - Estimated costs and revenues generated by providers that connect to the statewide HIE using an HIE-provided EHR lite.
- Value-added HIE products and services that can help providers meet meaningful use requirements and generate revenue to support sustainable HIE will be identified, including any potential added costs for incremental development and/or delivery of such products and services.
- The finance and revenue model does not include a return on investment (ROI) calculator; only direct sources of revenue are included in the model (ROI and cost avoidance are not included).

It is important to note that the financing approach is inherently flexible and that these assumptions may be adjusted or revised to reflect the conclusions of other Workgroups, the Advisory Board, or State.

Key Sources of Cost

There are many sources of cost that MO-HITECH and the Finance Workgroup are considering and examining while developing a financing approach and model to support the Statewide HIO and HIE in Missouri. The sources of cost may be grouped into several categories and influenced by multiple drivers:

- **Governance and Operations**: Governance and operations of the Statewide HIO are a significant source of cost driven by up-front capital necessary to establish the Statewide HIO, as well as initial and ongoing costs of staffing and contractors required to maintain and operate the Statewide HIO. Additional technology operations costs, such as the cost of building and maintaining a data center, and associated drivers will be incorporated based on decisions made in other workgroups.

- **Core Infrastructure**: The cost associated with the core infrastructure necessary for enabling statewide HIE are driven by the requirements of the core system and any associated services (*e.g.* MPI, authentication, data normalization, etc.), hardware or hosting fees, the need for a public or private network to cover the entire state, and implementation resources to support the deployment, testing, and training associated with the core system.

- **Participants and Connectivity**: Missouri has a diverse landscape of providers and healthcare organizations that will require different resources and varying levels of support to participate in the Statewide HIO. Different providers and provider organizations (*e.g.* critical access hospitals, FQHCs, and rural providers) must be considered in light of their current health IT adoption and number of providers or facilities. In addition, there will be varying costs associated with enabling connectivity with the Statewide HIO and laboratories, radiology centers, and health plans. Estimating the costs of connectivity for respective providers and organizations must take into consideration hardware and software requirements, implementation, and the cost of ongoing connectivity.

- **Additional and Value-Added Services**: Value-added services will be important to realizing revenue to support a Statewide HIO. While specific value-added services have yet to be selected and prioritized for implementation, for purposes of the financing approach the Workgroup will consider the costs of designing, implementing, and providing value-added services that are likely to be implemented in the context of the Statewide HIO. Such value-added services for consideration include, but are not limited to, advanced decision support, public health reporting, the provision of de-identified data for research purposes, and bio-surveillance. The Technical Infrastructure and Business and Technical Operations Workgroups are evaluating such services and a mechanism for their prioritization; the deliberations and conclusions of the Workgroups, Advisory Board, and the State will inform how value-added services are incorporated into the financing model.

Key Sources of Up-Front Financing and Ongoing Revenue

The funding opportunity created under the HIE Cooperative Agreement Program represents a significant up-front investment that is anticipated to jumpstart additional investments in HIE throughout the state of Missouri. In addition to the HIE Cooperative Agreement Program, HITECH authorizes a 90 percent federal match to state Medicaid programs to pursue initiatives encouraging the adoption of EHRs and promoting HIE and improvements in health care quality. Recognizing the magnitude of this parallel funding opportunity the Department of Social Services which oversees the state's Medicaid program is committed to working closely with MO-HITECH leadership to explore how to augment available up-front capital through administrative matching funds.

MO-HITECH and the Finance Workgroup recognize that funding under the HITECH Act is not likely to satisfy total capital requirements for statewide HIE in Missouri nor to provide a sustainable source of capital to support ongoing operations in the long-run. As part of the financing approach and model, the state is considering a range of potential sources of up-front capital funding in addition to those HITECH funding opportunities already discussed. Additional sources of financing under consideration include

state appropriations; Medicaid managed care programs; an all payor assessment; provider remittance fees; and insurance claims adjudications. The Workgroup is evaluating such funding sources and their feasibility to support a statewide HIE infrastructure; in parallel, the Technical Infrastructure and Business and Technical Operations Workgroup are prioritizing HIE services and value-added services that may generate revenue and will be incorporated into the financial model.

8.3 Sustainability

Financial sustainability will be critical to ensuring the success of statewide HIE for the state of Missouri. The costs of statewide HIE and interoperability do not stop with a successful implementation. Realizing the goal of a sustainable and self-financing HIO goes beyond implementation and requires sources of recurring revenue, inherently necessitating that participants in the Statewide HIO agree with the HIO's role, service offerings and value proposition. As part of the strategic and operational planning process, MO-HITECH and the Finance Workgroup are considering various sources of recurring revenue to be gained from connectivity, core meaningful use functionality, and value-added services. For example, participants may incur a charge for initial connectivity to the Statewide HIO, as well as a recurring fee for sustaining connectivity over time; these charges may be pro-rated according to participant type and availability of resources. Similar fees may be charged for providing specific functionality and value-added services that enable providers to achieve meaningful use. The state may also consider levying an assessment to help fund the Statewide HIO and support providers' connectivity on an ongoing basis. The Finance Workgroup will consider what type of assessment may be appropriate for various populations.

The Statewide HIO is charged with establishing a sustainable business model for HIE in the state of Missouri. MO-HITECH and the Finance Workgroup are laying the groundwork to identify how the Statewide HIO may best position itself and prioritize HIE services to ensure participation among health care stakeholders, including the implementation, measurement, and refinement where necessary, of a sustainability model.

9. EVALUATION

9.1 Overview

The statewide health IT and HIE evaluation efforts are designed to support the vision, goals, objectives and strategies in the Missouri HIE Strategic Plan. In compliance with ONC's requirements, MO-HITECH will monitor and report the State's progress toward achieving information exchange requirements for adoption, effective use and interoperability, and in satisfying state and federal definitions of meaningful use. The State will ensure adherence to specified reporting requirements, performance and evaluation measures, and methods to collect data and evaluate project performance. Through collaboration with the Business and Technical Operations Workgroup, MO-HITECH will oversee the development of a formal evaluation process to assess the impact of statewide HIE and related activities.

9.2 Principles

The guiding principles for Missouri's strategy to evaluate statewide HIE activities include:

- Prioritizing and supporting approaches to collect baseline and ongoing metrics within the five statewide HIE planning domains and consumer engagement to ensure accountability and proper reporting in alignment with ONC's requirements;
- Coordinating with and leveraging other public and private data collection and reporting activities and existing evaluation methodologies, tools, and strategies;
- Utilizing a flexible and incremental approach to phase-in data collection and reporting of process and outcome measures based on State resources and progression of statewide HIE functionalities;
- Incorporating the State's public health and clinical quality priorities in evaluation metrics; and
- Applying evaluation findings to drive further health care quality improvements.

9.3 Evaluation Approach

The Business and Technical Operations Workgroup has commenced planning efforts to develop the State's evaluation framework and strategy. Initial discussions have focused on overall approach and evaluation focus areas. The Workgroup is exploring whether to secure the services of a third-party organization, such as an academic institution, to more fully develop and implement the evaluation. Evaluation will likely involve more process-oriented measures initially, such as the meeting of certain milestones and enabling HIE capabilities that help providers achieve meaningful use, and progress to more outcomes-oriented measures as the statewide HIE infrastructure matures and more reliable clinical and financial data become available. Data collected for the environmental scan and through provider readiness surveys by the regional centers and other existing initiatives will help provide baseline information. While performance measures articulated in Federal guidance for state self-assessment and national evaluation will be prioritized, MO-HITECH will also examine additional avenues for study. For example, the Missouri Department of Health and Senior Services collects a rich dataset for public health purposes that can be linked to health care utilization information and tracked over time.

MO-HITECH will strive to continually assess the evaluation approach and appropriateness of measures and collect data on an at-least quarterly basis to facilitate useful and timely tracking of progress and allow for any necessary mid-course corrections. In addition, measures will be collected on the patient, provider, and facility-level to enable a variety of assessments.

9.4 Integrating with Reporting Requirements

Working with the Business and Technical Operations Workgroup, MO-HITECH will develop a coordinated evaluation plan that integrates multiple levels of measurement, reporting and evaluation and, to the extent possible, harmonizes ONC's reporting requirements with the reporting mandated under other Federal contracts, State requirements, and standard business practices. Coordinating across these requirements will allow MO-HITECH to leverage efficiencies. MO-HITECH is committed to the collection of ONC's reporting requirements applicable to planning activities and, as referenced in the Project Narrative, will report on a set of relevant requirements as part of the strategic planning process.

10. COORDINATION

10.1 Overview

Recognizing the interdependencies between statewide HIE and health IT adoption efforts under the Medicaid program, the regional center, and other Federally-funded, state-based initiatives through ARRA and otherwise, MO-HITECH is committed to ensuring strong coordination, integration, and alignment of statewide HIE development with these concurrent initiatives. MO-HITECH expects that the harmonization of these activities will not only offer opportunities to advance statewide HIE but also maximize impact and prevent duplication of scarce resources.

Shortly after the enactment of ARRA, Governor Jay Nixon issued an Executive Order to form a statewide Recovery Act coordinating body – the Transform Missouri Initiative. Comprised of key staff representing the fourteen relevant Executive Branch departments, the Transform Missouri Initiative Team, a team formed by Governor Nixon to oversee the Federal Recovery and Reinvestment Act funds was charged with analyzing the Recovery Act legislation and identifying state programs and projects that could benefit from the Recovery Act, developing a coordinated plan designed to maximize the impact of the Recovery Act, and implementing guidelines and practices that provide transparency and accountability. Through a second Executive Order, the Governor transitioned the Transform Missouri Initiative to the Transform Missouri Project, with ongoing responsibilities to oversee implementation of Recovery Act programs and coordinate all Recovery Act program applications, administration, and expenditures. DHSS and DSS representatives on the Transform Missouri Project Team also serve as key staff in MO-HITECH and provide a critical link for the integration of statewide HIE development with Missouri's parallel Recovery Act initiatives.

10.2 Medicaid

MO HealthNet, Missouri's Medicaid program, is a crucial component of statewide HIE planning and implementation. Missouri's statewide HIE strategy will leverage provider participation in the Medicaid incentive program to facilitate exchange while MO HealthNet's health IT strategy will integrate statewide HIE capabilities to support providers' realization of meaningful use incentives and ultimately improve health care coordination and quality for all MO HealthNet beneficiaries. MO HealthNet has already invested significant resources by developing a Service Oriented Architecture following Medicaid Information Technology Architecture (MITA) guidelines and is currently phasing-in implementation of connectivity with other HIE partners. In developing the technical infrastructure to support statewide HIE, Missouri intends to leverage MO HealthNet assets and to support MO HealthNet providers and their patients to ensure their access to statewide HIE services.

Fundamental to MO-HITECH's strategy for coordination of statewide HIE and MO HealthNet health IT adoption activities is the employment of a shared leadership and accountability structure. Missouri DSS houses both the MO-HITECH Office, the state-designated entity for statewide HIE development and the MO HealthNet Division, and DSS Director Ronald Levy serves as Missouri's Health IT Coordinator. MO HealthNet leadership – Director Dr. Ian McCaslin and Deputy Director Dr. George Oestreich – also actively participate in the MO-HITECH strategic planning process. Dr. McCaslin serves on the MO-HITECH Advisory Board and chairs the Business and Technical Operations Workgroup while Dr. Oestreich staffs both the Business and Technical Operations and the Technical Infrastructure Workgroup. Dr. Oesterich is also directly managing MO HealthNet's health IT strategy and planning and implementation activities related to the ARRA Medicaid incentive program, further ensuring close coordination.

Missouri has identified several interdependencies between the statewide HIE and Medicaid health IT planning efforts and organized coordination activities into five substantive work streams:

- **Meaningful Use** – Current public health and clinical quality reporting, such as HEDIS and CAHPS measures, and the Missouri's HIE goals will be integrated in MO HealthNet's

meaningful use definition and increasing requirements for meaningful use will be timed with statewide HIE capacities. Consideration will also be given the HIE requirements under the Federal Medicare meaningful use definition. MO HealthNet and state objectives and initiatives will be coordinated to encourage health IT and HIE adoption and meaningful use in the Medicaid provider population.

- **Medicaid Data Sharing** – MO HealthNet data will be made available through the Statewide HIO to allow for broader care coordination and statewide HIE and Medicaid health IT planning efforts will involve a coordinated review of significant existing state health IT investments – such as the Departmental Client Number utilized by the State's primary health and human services agencies and the collaborative effort to address health information exchange between these agencies, and the Missouri Clinical Management Services, Pharmacy, and Prior Authorization system (CMSP) – to explore the potential for leveraging and integrating these assets into a statewide infrastructure for health information exchange. Clinical decision support and other services made available through statewide HIE will also be incorporated to facilitate quality improvement.

- **Medicaid Incentive Program Deployment** – Missouri will design a mechanism for disbursement of Medicaid incentives that will encourage and support adoption of EHRs among MO HealthNet providers and coordinate with other state level initiatives and funding opportunities. Missouri will also explore deployment options that could further facilitate successful adoption of EHRs and help the State meet HIE goals, such as qualified intermediaries that enable community-wide technical assistance and group-purchasing.

- **Program Administration and Planning** – As described previously, Missouri's Medicaid health IT and strategic HIE planning activities are tightly coordinated. Missouri's statewide health information exchange goals, objectives, and capacities will be actively considered in program planning and integrated in the State Medicaid Health IT Plan

- **Medicaid/Medicare Incentive Program Coordination** – HIE requirements under the Federal Medicare meaningful use definition will inform MO-HITECH's efforts to advance HIE. In addition, Missouri will coordinate MO HealthNet's meaningful use definition with Federal Medicare meaningful use guidelines to assure consistency in HIE goals.

10.3 Regional Center

In parallel with the State HIE Cooperative Agreement Program, ONC announced the Regional Center (RC) Cooperative Agreement Program. The RC Program is intended to establish and support an estimated 70 (or more) RCs through a competitive process, with each RC serving a defined geographic area that does not overlap or otherwise duplicate any other RC's service area.[12] In total the RCs will support at least 100,000 primary care providers in achieving meaningful use of EHRs and enabling nationwide health information exchange.. RCs will also be responsible for offering technical assistance, guidance, and information on best practices.

The University of Missouri has assembled a diverse team – including Primaris (the State's QIO), Kansas City Quality Improvement Consortium, and the Missouri Primary Care Alliance – in its bid to be Missouri's RC. In addition, the University of Missouri will be coordinating activities with the Missouri Telehealth Network (MTN), one of the nation's first public-private partnerships in telehealth. The University of Missouri and its collaborators all possess significant experience in working directly with providers; several of the partners have conducted EHR implementation projects specifically or worked collaboratively with the State on past initiatives. Dr Grant Savage of the University of Missouri will be the principal investigator (PI) on the project; Dr. Karen Edison will serve as the Co-PI and Dr. Karl Kochendorfer will play a key role

[12] ONC anticipates that the first cycle of awards will result in at least one RC furnishing services within each of the ten HHS/CMS Regions. See http://www.hhs.gov/news/press/2010pres/02/20100212a.html for the press release announcing those applicants awarded funding in the first cycle.

as Co-Investigator. Dr. Kochendorfer is a primary care physician well-equipped with addressing provider adoption challenges. With this impressive level of experience and expertise, the State is supporting the University of Missouri's RC application.

The RC partners are actively engaged in the MO-HITECH strategic HIE planning process – serving as leadership, members and key staff of the various workgroups that provide recommendations to the MO HITECH Advisory Board. This arrangement allows for coordination between the RC's EHR adoption strategy and statewide HIE development. Dr. Kochendorfer serves as the chair of MO HITECH's Business and Technical Operations Workgroup, which is charged with developing strategies to support HIE capacity within the state and providing technical assistance as needed to support health IT adoption. Dr. Karen Edison, another RC manager, serves on the MO HITECH Advisory Board. A key staff member on the MO-HITECH and Transform Missouri Project team also participates in the RC candidate's weekly planning meetings, reinforcing knowledge sharing between the RC and statewide HIE planning processes and further bolstering the harmonization of these strategies.

The RC will target its activities to a subset of priority providers – with particular focus on primary care providers. The RC's strategy will leverage existing relationships with providers from previous work conducted (e.g., providers participating in the QIO or MTN) and engage these providers early. These providers will be able to give early feedback to allow the RC to make revisions to its approach or offerings and could also help to engage harder-to-reach providers.

The RC will perform an array of health IT adoption and support services that will ultimately enable robust, statewide HIE, including:

- Conducting provider readiness assessments;
- Assessing provider eligibility for Medicare/Medicaid meaningful use incentives;
- Assisting providers with the selection of appropriate systems and negotiating group purchasing contracts with vendors; and
- Helping all providers achieve the full benefit of the EHR system and eligible providers meet meaningful use criteria through training, ongoing technical assistance, workflow re-design and troubleshooting.

The RC candidate, in collaboration with various primary care provider associations in Missouri, is currently preparing for deployment of a survey to assess providers' health IT adoption readiness and knowledge of meaningful use incentive program requirements.

10.4 Other Funding Programs and Sources

- **Broadband** – Broadband access is integral to enabling statewide HIE. Missouri recently received ARRA funding for mapping ($1,500,000) and planning ($470,000) initiatives. In partnership with private and non-profit partners, MO-HITECH will (1) catalogue and track the adoption and availability of broadband services to provide the context for broadband development, (2) create regional technology planning teams within an existing regional planning council framework; and (3) develop and host an Information Technology Summit for academia, business, industry, legislature, government, and local citizens about the applications for information technology.

  Mapping activities will provide critical information in the development of the technical infrastructure for statewide HIE and planning activities. In particular the timing for access to broadband, will inform the state's timetable for robust, statewide HIE. Broadband and statewide HIE planning are currently coordinated through the Transform Missouri Project and MO-HITECH is facilitating more active coordination between these efforts.

- **Workforce Development** – Funding to develop programs and curricula to prepare a skilled workforce for the deployment of HIT and statewide HIE has been followed with great interested in Missouri. Missouri is supporting the University of Missouri's applications for two such opportunities, will continue to assess any available ARRA funding opportunities with interested educational institutions, and will assure coordination of workforce funding with statewide HIE planning activities.

  In collaboration with higher education partners – St. Louis Community College, Metropolitan Community College, State Fair Community College, and Crowder Community College – and corporate collaborators – Cerner, the Tiger Institute, and Physicians EHR – the University of Missouri proposes to implement a Curriculum Development Center (CDC) that would develop and disseminate curriculum components easily replicated by community colleges throughout the region to meet the predicted workforce deficiencies in health information technology. The project team envisions the curriculum components will be accessed electronically, vastly broadening the potential uses and the potential users.

  With Stephens College and St. Louis University, the University of Missouri also proposes to form the Midwest Consortia on University-Based Training, combining premier health informatics and information management programs to leverage the collective current resources and expertise across the three institutions. The consortia would more training for jobs by rapidly increasing the availability of health information technology professionals requiring university-level training and also improve health care by making it more cost effective and patient-focused.

- **Other State-Based Programs** – The Missouri HIE Operational Plan will address further coordination with relevant State-Based programs such as the State Office of Rural Health Policy, State Office of Primary Care, the State Medicad/Children's Insurance Program, and Indian Health Services, among others.

11. APPENDICES

11.1 Definition of Terms

American Recovery and Reinvestment Act of 2009 (ARRA): is a $787.2 billion stimulus measure, signed by President Obama on February 17, 2009, that provides aid to states and cities, funding for transportation and infrastructure projects, expansion of the Medicaid program to cover more unemployed workers, health IT funding, and personal and business tax breaks, among other provisions designed to "stimulate" the economy.

Centers for Medicare and Medicaid Services (CMS): is a federal agency within the United States Department of Health and Human Services that administers the Medicare program and works in partnership with state governments to administer Medicaid, the State Children's Health Insurance Program (SCHIP), and health insurance portability standards.

Certification Commission for Healthcare IT (CCHIT): is a recognized certification body (RCB) for electronic health records and their networks. It is an independent, voluntary, private-sector initiative, established by the American Health Information Management Association (AHIMA), the Healthcare Information and Management Systems Society (HIMSS), and The National Alliance for Health Information Technology.

Consent: The Health Insurance Portability and Accountability Act Privacy Rule sets out two types of permission that are used to permit a covered entity to use or disclose protected health information: consent and authorization. A written "authorization" is required in certain circumstances, including for most disclosures of psychotherapy notes; to disclose health information for "marketing"; and for uses and disclosures that are not otherwise required or permitted by the privacy regulation. The Privacy Rule, however, generally permits a covered entity to use and disclose protected health information without an individual's authorization for treatment, payment and health care operations, and certain other specified purposes.

The Privacy Rule includes detailed requirements for the authorization form that must be used to obtain authorization when required. All authorization forms must contain certain core elements, including:

- A specific description of the information to be used or disclosed and the purposes of the use or disclosure;
- The identity of the person or class of persons authorized to make the requested use or disclosure;
- The identity of the person or class of persons to whom the covered entity may make the requested use or disclosure;
- A statement of the person's right to revoke the authorization; and
- The signature and date of the authorization.

A general "consent" is permitted but not required for use or disclosure of information for treatment, payment, and health care operations. Covered entities that choose to obtain a patient's consent for use or disclosure of information for treatment, payment, and health care operations have complete discretion in designing their consent form and process. The regulation does not define the term "consent" and does not specify any requirements for the content of consent forms.

Electronic Health Record (EHR): As defined in the ARRA, an Electronic Health Record (EHR) means an electronic record of health-related information on an individual that includes patient demographic and clinical health information, such as medical histories and problem lists; and has the capacity to provide

clinical decision support; to support physician order entry; to capture and query information relevant to health care quality; and to exchange electronic health information with, and integrate such information from other sources.

Electronic Prescribing (ePrescribing): A type of computer technology whereby physicians use handheld or personal computer devices to review drug and formulary coverage and to transmit prescriptions to a printer or to a local pharmacy. E-prescribing software can be integrated into existing clinical information systems to allow physician access to patient-specific information to screen for drug interactions and allergies.

Federal Communications Commission (FCC): is the United States government agency charged with regulating interstate and international communications by radio, television, wire, satellite and cable.

Federally-Qualified Health Centers (FQHCs): are "safety net" providers such as community health centers, public housing centers, outpatient health programs funded by the Indian Health Service, and programs serving migrants and the homeless. FQHCs provide their services to all persons regardless of ability to pay, and charge for services on a community board approved sliding-fee scale that is based on patients' family income and size. FQHCs are funded by the federal government under Section 330 of the Public Health Service Act.

Health Information Exchange (HIE): As defined by the Office of the National Coordinator and the National Alliance for Health Information Technology (NAHIT), Health Information Exchange means the electronic movement of health-related information among organizations according to nationally recognized standards.

Health Information Technology (Health IT): As defined in the ARRA, Health Information Technology means hardware, software, integrated technologies or related licenses, intellectual property, upgrades, or packaged solutions sold as services that are designed for or support the use by health care entities or patients for the electronic creation, maintenance, access, or exchange of health information.

Health Information for Economic and Clinical Health (HITECH) Act: collectively refers to the health information technology provisions included at Title XIII of Division A and Title IV of Division B of the ARRA.

Health Insurance Portability and Accountability Act (HIPAA): was enacted by Congress in 1996. Title I of HIPAA protects health insurance coverage for workers and their families when they change or lose their jobs. Title II of HIPAA, known as the Administrative Simplification (AS) provisions, requires the establishment of national standards for electronic health care transactions and national identifiers for providers, health insurance plans, and employers. The Administration Simplification provisions also address the security and privacy of health data. The standards are meant to improve the efficiency and effectiveness of the nation's health care system by encouraging the widespread use of electronic data interchange in the U.S. health care system.

Health Information Organization (HIO): An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards.

Healthcare Information Technology Standards Panel (HITSP): A multi-stakeholder coordinating body designed to provide the process within which stakeholders identify, select, and harmonize standards for communicating and encouraging broad deployment and exchange of healthcare information throughout the healthcare spectrum. The Panel's processes are business process and use-case driven, with decision making based on the needs of all NHIN stakeholders. The Panel's activities are led by the American National Standards Institute (ANSI), a not-for-profit organization that has been coordinating the U.S. voluntary standardization system since 1918.

Interface: A means of interaction between two devices or systems that handle data.

Interoperability: Interoperability means the ability of health information systems to work together within and across organizational boundaries in order to advance the effective delivery of healthcare for individuals and communities.

Meaningful EHR User: As set out in the ARRA, a Meaningful EHR user meets the following requirements: (i) use of a certified EHR technology in a meaningful manner, which includes the use of electronic prescribing; (ii) use of a certified EHR technology that is connected in a manner that provides for the electronic exchange of health information to improve the quality of health care; and (iii) use of a certified EHR technology to submit information on clinical quality and other measures as selected by the Secretary of HHS.

Nationwide Health Information Network (NHIN): A national effort to establish a network to improve the quality and safety of care, reduce errors, increase the speed and accuracy of treatment, improve efficiency, and reduce healthcare costs.

Notification: While the term notification is not directly contemplated in Health Insurance Portability and Accountability Act, the concept of providing notice of privacy practices is. The Privacy Rule requires a covered entity to provide individuals with a written notice describing the entity's privacy practices. Health plans are required to give notice at enrollment and to notify individuals every three years that the privacy practices notice is available. Providers that have a direct treatment relationship with an individual are only required to give notice at the date of the first service delivery; and except in emergency circumstances, must make a good faith effort to obtain a written acknowledgment from the individual of receipt of the notice. Providers must also have notice posted on the premises. Both plans and providers have special notice requirements if their privacy practices change. Clearinghouses acting as business associates of another covered entity are not required to give notice to patients. The notice must include:

- A description of an individual's rights with respect to protected health information and how the individual may exercise those rights;
- The legal duties of the covered entity;
- A description of the types of uses and disclosures of information that are permitted, including those that are permitted or required without the individual's written authorization;
- How an individual can file complaints with the covered entity and the Secretary of HHS;
- How the covered entity will provide the individual with a revised notice if the notice is changed;
- A contact person for additional information; and
- The date on which the notice is in effect.

Office of the National Coordinator (ONC): serves as principal advisor to the Secretary of HHS on the development, application, and use of health information technology; coordinates HHS's health information technology policies and programs internally and with other relevant executive branch agencies; develops, maintains, and directs the implementation of HHS' strategic plan to guide the nationwide implementation of interoperable health information technology in both the public and private health care sectors, to the extent permitted by law; and provides comments and advice at the request of OMB regarding specific Federal health information technology programs. ONC was established within the Office of the Secretary of HHS in 2004 by Executive Order 13335.

Privacy: In December 2008, the Office of the National Coordinator for Health IT released its "Nationwide Privacy and Security Framework For Electronic Exchange of Individually Identifiable Health Information," ("Framework") in which it defined privacy as, "An individual's interest in protecting his or her individually identifiable health information and the corresponding obligation of those persons and entities that

participate in a network for the purposes of electronic exchange of such information, to respect those interests through fair information practices." This language contrasts with the definition of privacy included in the National Committee on Vital and Health Statistics' ("NCVHS") June 2006 report, entitled, "Privacy and Confidentiality in the Nationwide Health Information Network." In its report, NCVHS recommended the following definition for "privacy": "Health information 'privacy' is an individual's right to control the acquisition, uses, or disclosures of his or her identifiable health data."

Regional Health Information Organization (RHIO): A health information organization that brings together healthcare stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community.

Regional Centers (RCs): As set out in the ARRA, Regional Centers will be established and may qualify for funding under ARRA to provide technical assistance and disseminate best practices and other information learned from the Health Information Technology Research Center to aid health care providers with the adoption of health information technology.

State-Designated Entities (SDEs): As defined in the ARRA, State-Designated Entities (SDEs) may be designated by a State as eligible to receive grants under Section 3013 of the ARRA. To qualify as an SDE, an entity must be a not-for-profit entity with broad stakeholder representation on its governing board; demonstrate that one of its principal goals is to use information technology to improve health care quality and efficiency through the authorized and secure electronic exchange and use of health information; adopt nondiscrimination and conflict of interest policies that demonstrate a commitment to open, fair, and nondiscriminatory participation by stakeholders; and conform to other requirements as specified by HHS.

Security: The Health Insurance Portability and Accountability Act Security rule defines "Security or Security measures" as "encompass[ing] all of the administrative, physical, and technical safeguards in an information system."

U.S. Department of Health and Human Services (HHS): is the federal government agency responsible for protecting the health of all Americans and providing essential human services. HHS, through CMS, administers the Medicare (health insurance for elderly and disabled Americans) and Medicaid (health insurance for low-income people) programs, among others.

11.2 MO-HITECH Advisory Board

- Barrett A. Toan, Private Sector Co-Chair
- Ronald J. Levy, Dir., DSS and HIT Coordinator, Public Sector Co-Chair
- Donald Babb, CEO, Citizens Memorial Hospital, Bolivar
- Steve Calloway, Pharmacy
- Representative Shalonn Curls
- Margaret T. Donnelly, Director DHSS and Public Health
- Karen Edison, MD, Missouri Center for Health Policy
- Tracy Godfrey, MD, Family Physician, Joplin
- Tom Hale, MD, PhD, Sisters of Mercy Health System
- Sandra Johnson, JD, LL.M, Emerita Professor of Law and Health Care Ethics, St. Louis University School of Law
- Herb B. Kuhn, President & CEO, Missouri Hospital Association
- Ian McCaslin, MD, Director, MO HealthNet Division
- Joe Pierle, CEO, Missouri Primary Care Association
- Verneda Robinson, CEO, Swope Health Systems
- Andrea Routh, Health Advocacy Alliance
- Senator Eric Schmitt
- Mahree Skala, Missouri Association of Local Public Health Agencies
- Steven C. Walli, President & CEO, United Healthcare MO
- David Weiss, CIO, BJC Healthcare
- Karl Wilson, President & CEO, Crider Center for Mental Health